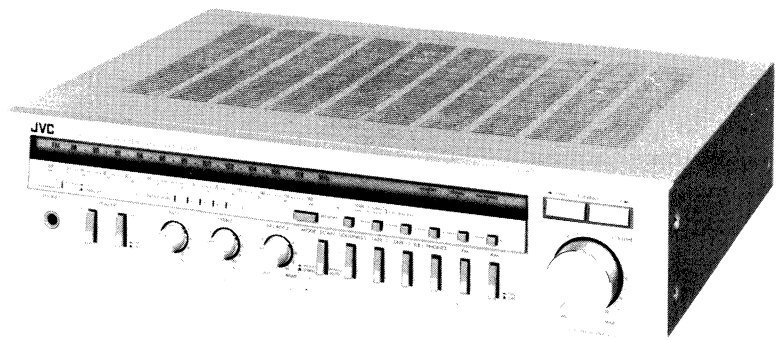
JVC

SERVICE MANUAL

MODEL R-2X

SYNTHESIZER STEREO RECEIVER



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1. Specifications

FM Tuner Section (Figures are based upon IHF Standard)

Tuning Range	: *87.5 MHz – 108.0 MHz (87.5–108.0 MHz for 50 kHz step)
Usable Sensitivity (IHF)	: 10.3 dBf (1.8 μV/300 Ω)
50 dB Quieting Sensitivity	
Mono	: 14.8 dBf (3 μV/300 Ω)
Stereo	: 38.3 dBf (45 μV/300 Ω)
Distortion	
Mono	: 0.1 % (1 kHz) 0.15 % (1 kHz, DIN)
Stereo	: 0.3 % (1 kHz) 0.4 % (1 kHz, DIN)
Signal to Noise Ratio (at 98 MHz)	
Mono	: 83 dB (IHF A-network weighted) (74 dB, DIN)
Stereo	: 75 dB (IHF A-network weighted) (65 dB, DIN)
Selectivity	: 65 dB, ±400 kHz (55 dB, 300 kHz, DIN)
Capture Ratio	: 1.0 dB
IF Rejection	: 90 dB at 98 MHz
Image Rejection	: 60 dB at 98 MHz
Stereo Separation	: 45 dB at 1 kHz (40 dB at 1 kHz, DIN)

AM Tuner Section

Tuning Range	: *520 kHz – 1610 kHz (522–1602 kHz for 9 kHz step)
Usable Sensitivity	: 40 μV (External Antenna) 200 μV/m
Signal to Noise Ratio	: 50 dB at 100 mV/m
Distortion	: 0.5 % at 100 mV/m
Selectivity	: 40 dB ±10 kHz (36 dB ±9 kHz, DIN)

Amplifier Section

Output Power and Total Harmonic Distortion	: 40 watts per channel, min. RMS, both channels driven, into 8 ohms from 20 Hz to 20 kHz, with no more than 0.03 % total harmonic distortion 42 watts per channel, min. RMS, both channels driven, into 8 ohms at 1 kHz with no more than 0.008 % total harmonic distortion
Input Sensitivity/Impedance	
Phono	: 2.5 mV/47 kΩ
Tape Play 1, 2	: 150 mV/40 kΩ (150 mV/40 kΩ, DIN)
Tone Control	
Bass	: ±8 dB at 100 Hz
Treble	: ±8 dB at 10 kHz
Signal to Noise Ratio (IHF short-ciruited A-network)	: Phono 71 dB (New IHF 74 dB) Tape Play 91 dB (New IHF 78 dB)

(Note) *U.S.A. & CANADA

Design and specifications subject to change without notice.

Dimensions and Weight

Areas	Dimensions			Weight
	Height	Width	Depth	Net
U.S.A., Canada & U.S. Military Market	9.5 cm (3-3/4")	44.4 cm (17-1/2")	35.0 cm (13-3/4")	5.9 kg (13.0 lbs.)
All Other Countries	9.4 cm (3-11/16")	42.0 cm (16-9/16")	35.0 cm (13-3/4")	5.6 kg (12.3 lbs.)

Power Specifications

Areas	Line Voltage & Frequency	Power Consumption
U.S.A. and Canada	AC 120 V, 60 Hz	195 W 245 VA
Europe	AC 220 V∿, 50 Hz	400 W
Australia and U.K.	AC 240 V∿, 50 Hz	400 W
Other Areas	AC 110/120/220/240 V∿ Selectable, 50/60 Hz	400 W

2. Names and Their Functions

FRONT PANEL

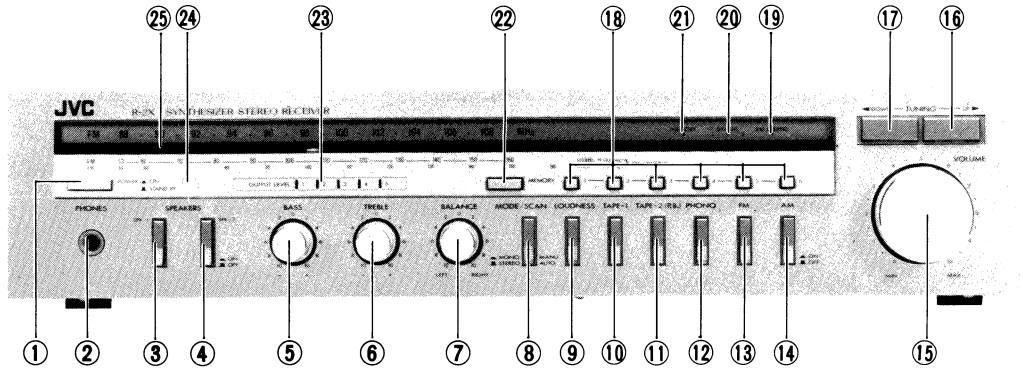


Fig. 1

1. **POWER switch**
   ON: Press to turn the power on. The power indicator (24) will light. During the first 3 or 4 seconds after the POWER switch is turned on, no sound will be heard until you hear the "click" of the relay operation. This is not due to any defect in the unit, but due to the power protection circuit muting switching noise for speaker protection.
   STAND BY: When the power cord is plugged into an AC outlet, the preset stations are not cancelled or altered. The preset data are maintained even in the case of a power failure or when the power cord is disconnected, if the period of non-applied power does not exceed a couple of days.
2. **Headphone jack (PHONES)**
   Plug stereo headphones into this jack for private listening and recording monitoring.
3. **SPK-1 switch**
   Press to switch the speakers connected to the SPEAKER SYSTEM 1 terminals on or off.
4. **SPK-2 switch**
   Press to switch the speakers connected to the SPEAKER SYSTEM 2 terminals on or off.
5. **BASS control**
   Turn clockwise to boost bass response, counterclockwise to decrease bass response.
6. **TREBLE control**
   Turn clockwise to boost treble response, counterclockwise to decrease treble response.
7. **BALANCE control**
   Turn to balance the left and right speakers. When it is fully counterclockwise, only the left channel will be heard, and vice versa.
8. **MODE/SCAN switch**
   This switch is used to select both STEREO/MONO mode and AUTO/MANUAL scanning mode. These functions are related to each other. When stereo reception is possible, set this switch to AUTO/STEREO (▟) for auto tuning. When signals are too weak to be received, set to MANU/MONO (▬) for manual tuning; in this mode the left and right channel signals are mixed and heard from both speakers; FM muting is not effective.
9. **LOUDNESS switch**
   At low volumes, certain tones seem to change. This is not alteration of the sound at lower volumes. Press this switch to compensate for this apparent alteration when you are listening at lower volumes.
10. **TAPE-1 switch**
    Press to listen to a tape deck connected to the rear panel TAPE-1 terminals or TAPE-1 DIN socket.
11. **12, 13, 14. Source select switches (TAPE-2, PHONO, FM, AM)**
    TAPE-2 (PB): Press to listen to sources connected to the rear panel TAPE-2 (PB) terminals.
    PHONO: Press to listen to records played on a turntable connected to the rear panel PHONO terminals.
    FM: Press to switch on the FM tuner section.
    AM: Press to switch on the AM tuner section.
    Notes:
    - When one source is selected by pressing the corresponding switch, the one selected previously is automatically released. To avoid malfunctions, do not press two or more switches simultaneously or release all switches.
    - When changing from PHONO, TAPE-2 (PB) to FM, AM, normally bleeps will be heard; this may not happen, depending on the order in which buttons are pressed.
15. **VOLUME control**
    Turn the right to increase the volume.
16. **17. TUNING buttons**
    Auto tuning
    Up-scanning button (16): Press this momentarily to start automatic scanning to higher frequencies. When scanning is taking place, bleeps will be heard and the LEDs in the tuning dial will indicate increasing frequencies. When a station is received, scanning stops and the LED lit in the dial scale indicates its frequency. Auto scan tuning will not stop when the station is not strong enough for good reception. When the top frequency in the waveband selected is reached, scanning starts in the opposite direction. If you continue to press the scanning button when the top frequency has been reached, scanning will stop at the top frequency. When this button is held pressed, scanning does not stop even if there are stations.
    Down-scanning button (17): Press momentarily to scan to lower frequencies. Its operation is exactly the same as in up-scanning.
    Note:
    When tuning by auto scanning is impossible, set the MODE/SCAN switch (8) to MANU/MONO.

Manual tuning
Manual tuning is used when the station required is too weak to be received by auto tuning. Press the MODE/SCAN switch(8). Now pressing the scanning buttons changes the frequency in predetermined steps (FM: 100 kHz U.S.A. and Canada, 50 kHz other countries; AM: 10 kHz U.S.A. and Canada, 9 kHz other countries). Tapping the scanning button changes the frequency in single steps, holding it in changes frequency continuously; when the button is released, scanning stops.

Note:
When manual tuning is used, it does not automatically reverse the direction of scanning when the upper or lower frequency limit is reached.

18. **Station select buttons**
These buttons are used to select one of the preset stations or to memorize a frequency in a channel. If one of these buttons is pressed after the MEMORY switch(22) has been pressed, the station which is being received will be "Memorized". Each of the station select buttons can be used for one FM station and one AM station. When the MEMORY indicator is not lit, press one of these buttons, to receive the station held in memory, a bleep will be heard.

Notes:
- It is impossible to memorize twice continuously in the same preset channel (for example, FM-1) to prevent an error in operation. If necessary, memorize using an other channel (for example, FM-2) and next memorize in the channel used previously.
- Do not leave unmemorized preset channels as this may cause mistuning.
- Do not press the MEMORY switch and the preset button at the same time. Be sure to release the MEMORY switch and then press the preset button.
- When storing in memory, a bleep is not heard when the station select button is pressed.

19. **FM STEREO indicator**
This LED lights when an FM stereo broadcast is tuned in.
20. **SIGNAL strength indicator**
This is used in tuning to both FM and AM broadcasts. The more LEDs light, the stronger the signal being received.
21. **MEMORY indicator**
When the MEMORY button is pressed, this MEMORY indicator lights to show that the unit is ready to register the preset station to memory. This indicator will go out automatically in about 7 sec. or when the station select button is pressed.
22. **MEMORY switch**
Press this switch and the memory indicator will light to show that this unit is ready to receive a memory setting. Pressing the station select button while the MEMORY indicator is lit (for about 7 sec.) makes it possible to memorize the station being received. When the MEMORY indicator is not lit, the memory function does not operate.
23. **OUTPUT LEVEL indicator**
These LED's indicate the output level.
24. **Power indicator**
Lights green when the POWER switch is pressed in.
25. **Tuning dial LED**
The tuned-in frequency is displayed by this LED.
If the channel spacing step is changed to 9 kHz (10 kHz), use the 9k (10 k) tuning dial scale. (for U.S.A., Canada and some other countries)

Notes:
- The bottom LED is the same for both FM & AM, but the top LED is different for the FM and AM bands.
- One LED covers 8 channels in FM (U.S.A. and Canada), covers 16 channels in FM (Europe and other countries) and 4 channels in AM. Therefore, a single LED may correspond to more than one station.

REAR PANEL

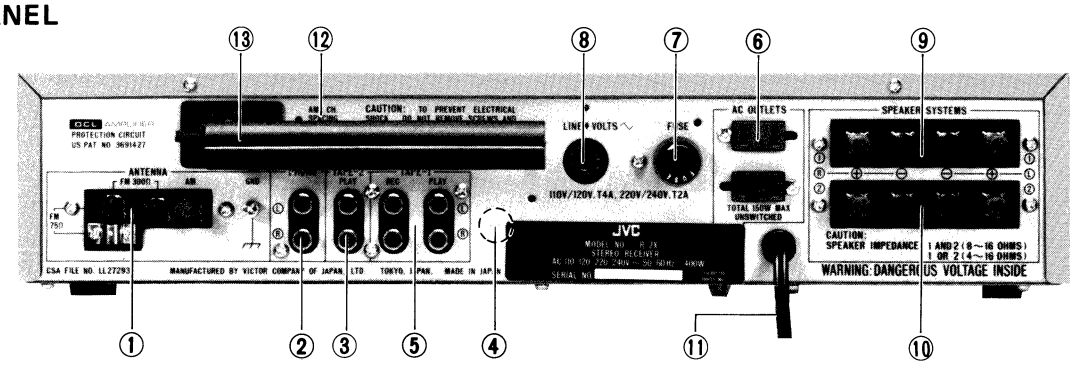
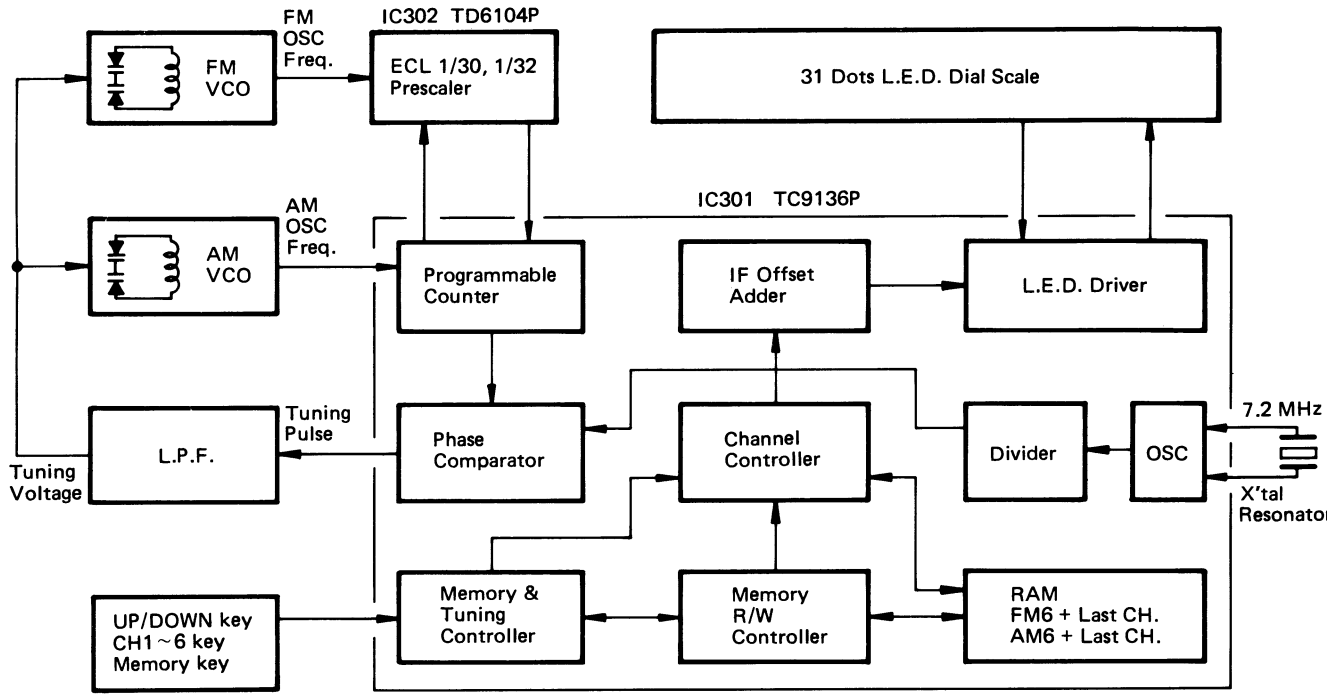


Fig. 2

1. External ANTENNA terminals
2. PHONO terminals
3. TAPE-2 (PLAYBACK) terminals
4. TAPE DIN socket*
*(Provided on sets for Continental Europe, the United Kingdom and Australia.)
5. TAPE-1 terminals
6. AC OUTLET**
**(Not provided on sets for Continental Europe, the United Kingdom and Australia.)
7. Fuse holder***
8. Voltage selector***
***(Not provided on sets for U.S.A., Canada, Continental Europe, the United Kingdom and Australia.)
9. SPEAKER SYSTEM 1 connection terminals
10. SPEAKER SYSTEM 2 connection terminals
11. Power cord
12. AM channel spacing switch
(Provided on sets for the U.S.A., Canada, etc. Set this switch according to the AM channel spacing (9 kHz or 10 kHz) steps of your country.)
13. AM ferrite bar antenna

3. Explanation of New Technology

3-(1) Synthesizer Circuits



Block Diagram of PLL Synthesizer

Fig. 3

The PLL synthesizer of the R-2X is comprised of two newly developed ICs. One is a 42-pin package PLL synthesizer-controller-LED driver. The other is a 7-pin package pulse-swallow prescaler which divides frequency at the ratios of 1 to 30 and 1 to 32 selectively.

This new PLL synthesizer system has the following features.

1. Operations for controlling keys and driving display LEDs are fully static. Because of this, noise is reduced with the result of good S/N in FM reception and high sensitivity in AM.
2. Because of the pulse-swallow prescaler employed, the reference frequency of FM is as high as 25 kHz with the result of good S/N in FM mode.
3. A piezoelectric buzzer element sounds each time a key has been operated.
4. A 31-point LED dial scale may be used which combines the legibility of the conventional analog dial scale with the accuracy of a digital one.

For the operation of PLL and improved S/N by static operation and pulse-swallow prescaler, refer to Service Manuals T-40P (No. 2467) and T-X6 (No. 2511).

3-(2) 31-Point LED Dial Scale Display

The R-2X's front-panel dial scale is mounted with 31 LEDs. The anode of each LED is connected to H1 – H4 (pins 28 – 31) of IC301, and the cathode to $\overline{L1}$ – $\overline{L8}$ (pin 20 – 27).

H1 – H4 and $\overline{L1}$ – $\overline{L8}$, whose internal arrangements are shown below, operate by push-pull to drive an LED.

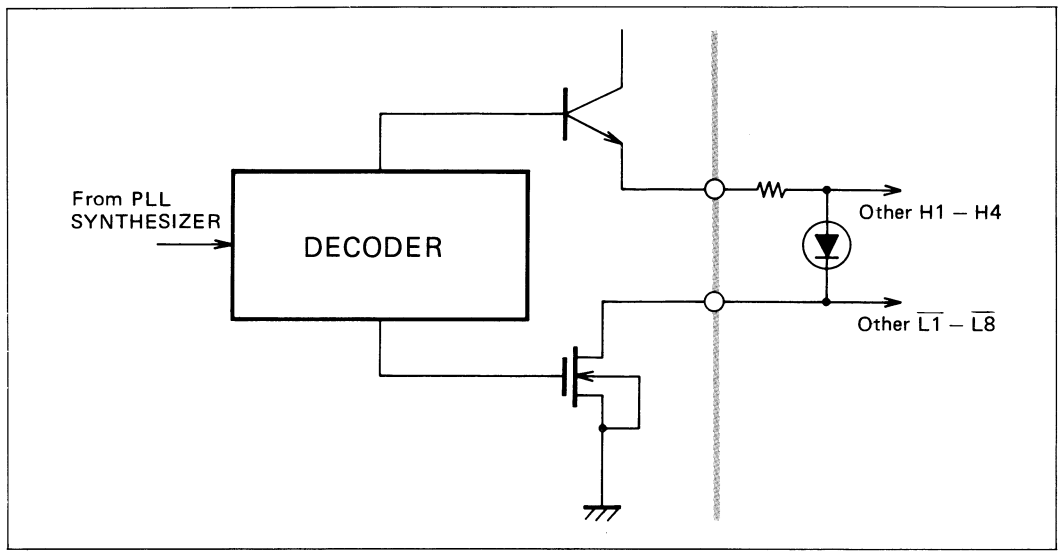


Fig. 4

This LED dial scale display digitally converts the accurate frequency data provided by the PLL synthesizer linearly into display drive data. Therefore, the scale divisions are really linear in both FM and AM bands.

Frequency range having an LED is always constant as shown below chart.

Band	Bound for	Number of channels	Channels/ LED	Band-width/ LED	Working LEDs
FM CH. SPACING 100 kHz	J, C	206	8	800 kHz	26
FM CH. SPACING 50 kHz	E, A, BS, U, P, UP	411	16	800 kHz	26
AM CH. SPACING 10 kHz	J, C, P, UP	110	4	40 kHz	28
AM CH. SPACING 9 kHz	E, A BS, U	121	4	36 kHz	31

As shown above, the bottom band-edge LED is fixed but the top band-edge LED varies. It is the 26th one in FM, the 28th one in AM (CH. SPACING 10 kHz), and the 31st one in AM (CH. SPACING 9 kHz).

The number of working LEDs varies by 10 kHz and 9 kHz of AM CH. SPACING. Therefore, for areas (J, C, U, P, and UP) where AM CH. SPACING may be switched over 9 and 10 kHz, an AM CH. SPACING switch is provided on the rear panel. At this time, out of two sets of front-panel AM dial scale marks, that which corresponds to the setting of the AM CH. SPACING switch should be read. (The dial scale is designed only for 9 kHz in those which are bound for E, A, and BS.)

In this system, the buzzer will sound while scanning up and down, switching over FM and AM, and selecting a preset station.

For this buzzer, the front bracket is fitted at the right side and the symbol No. in the schematic diagram is PB101.

This buzzer which is comprised of a ceramic piezoelectric element sounds when AC signal of approximately 5 Vp-p is applied to its terminals. Frequencies of a few kilohertz are most likely to cause resonance and produce big sounds. The R-2X uses pulse signals of approximately 2.5 kHz to let the buzzer sound so that key operation may be easily confirmed.

Note:

J : U.S.A.
C : Canada
E : Europe
A : Australia
BS: U.K.
P : U.S. Military Market
U :
UP: } Other Countries

4. Main Parts Location and Part Numbers

4-(1) Front View

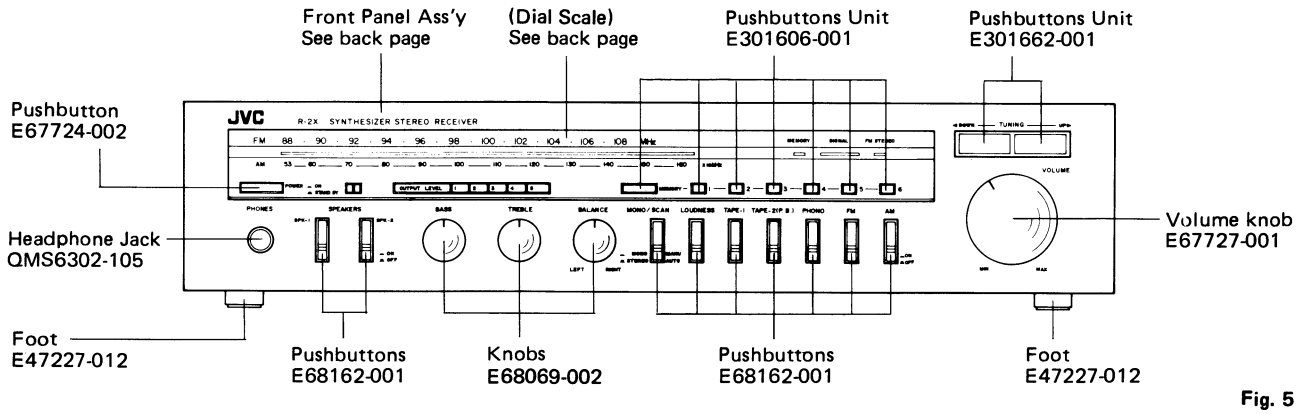


Fig. 5

4-(2) Rear View

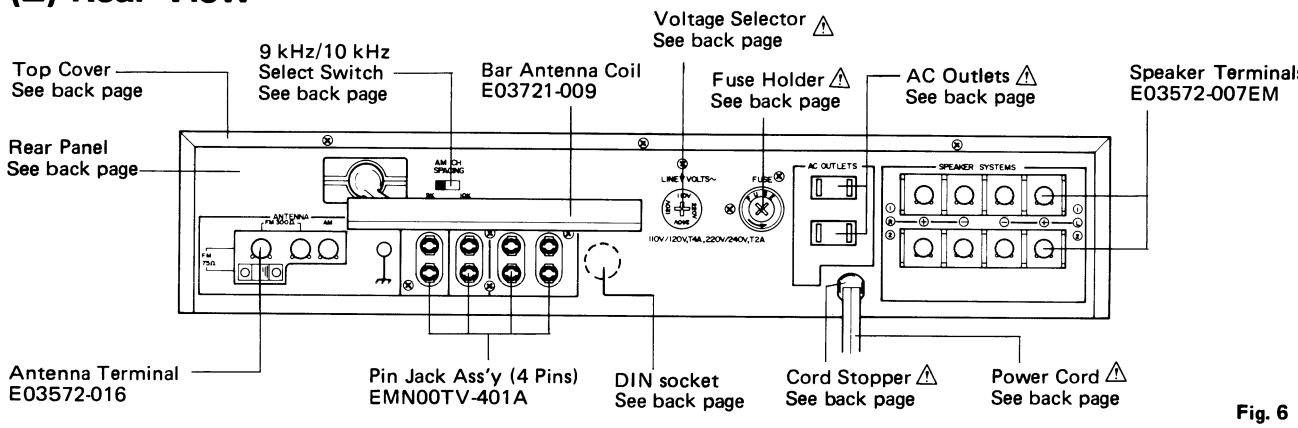


Fig. 6

4-(3) Top View

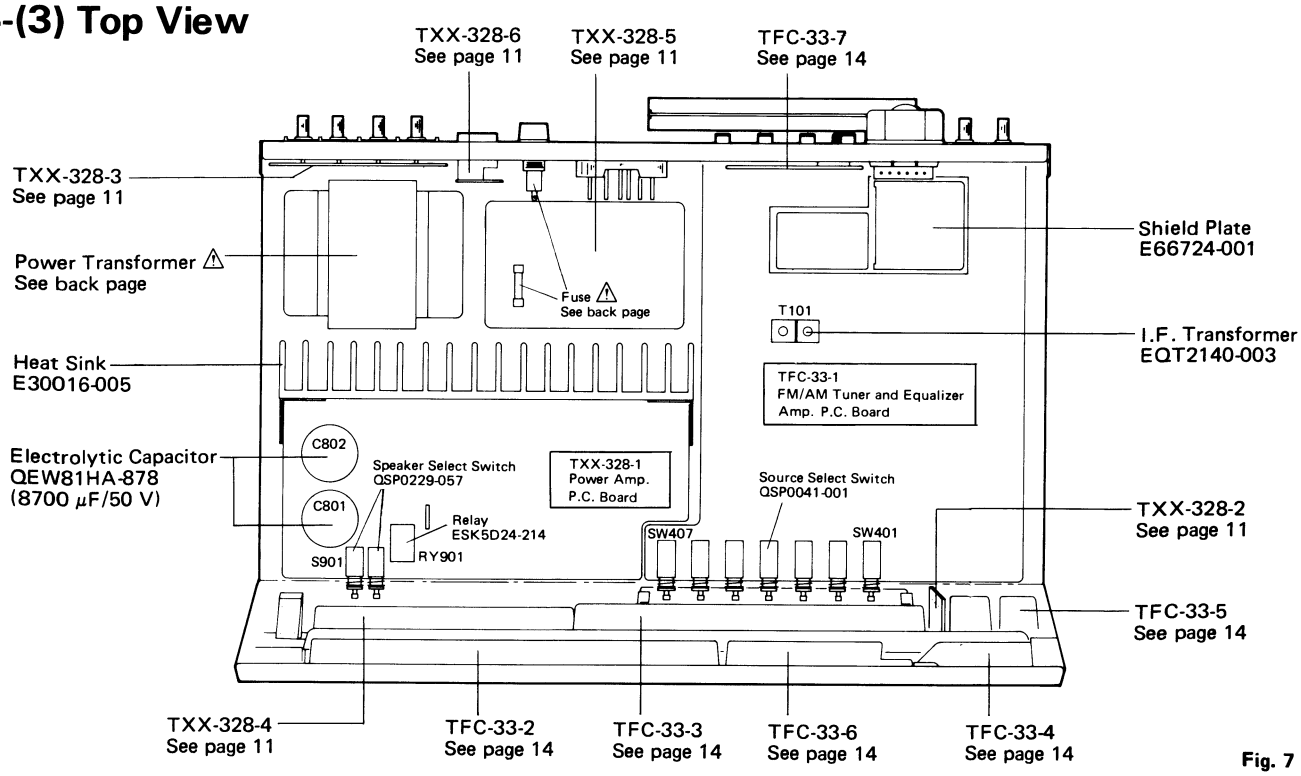
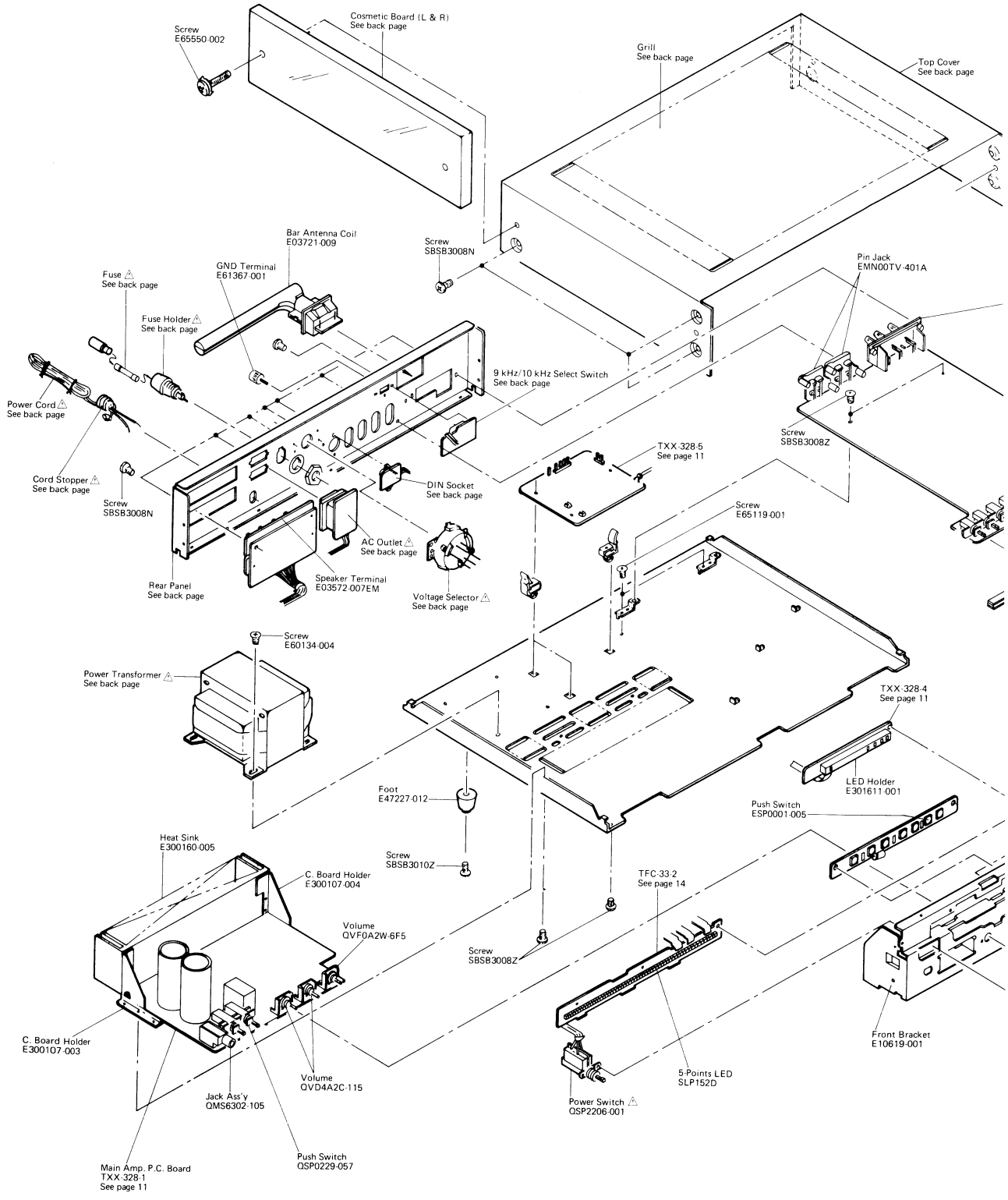


Fig. 7

5. Exploded View and Part Numbers



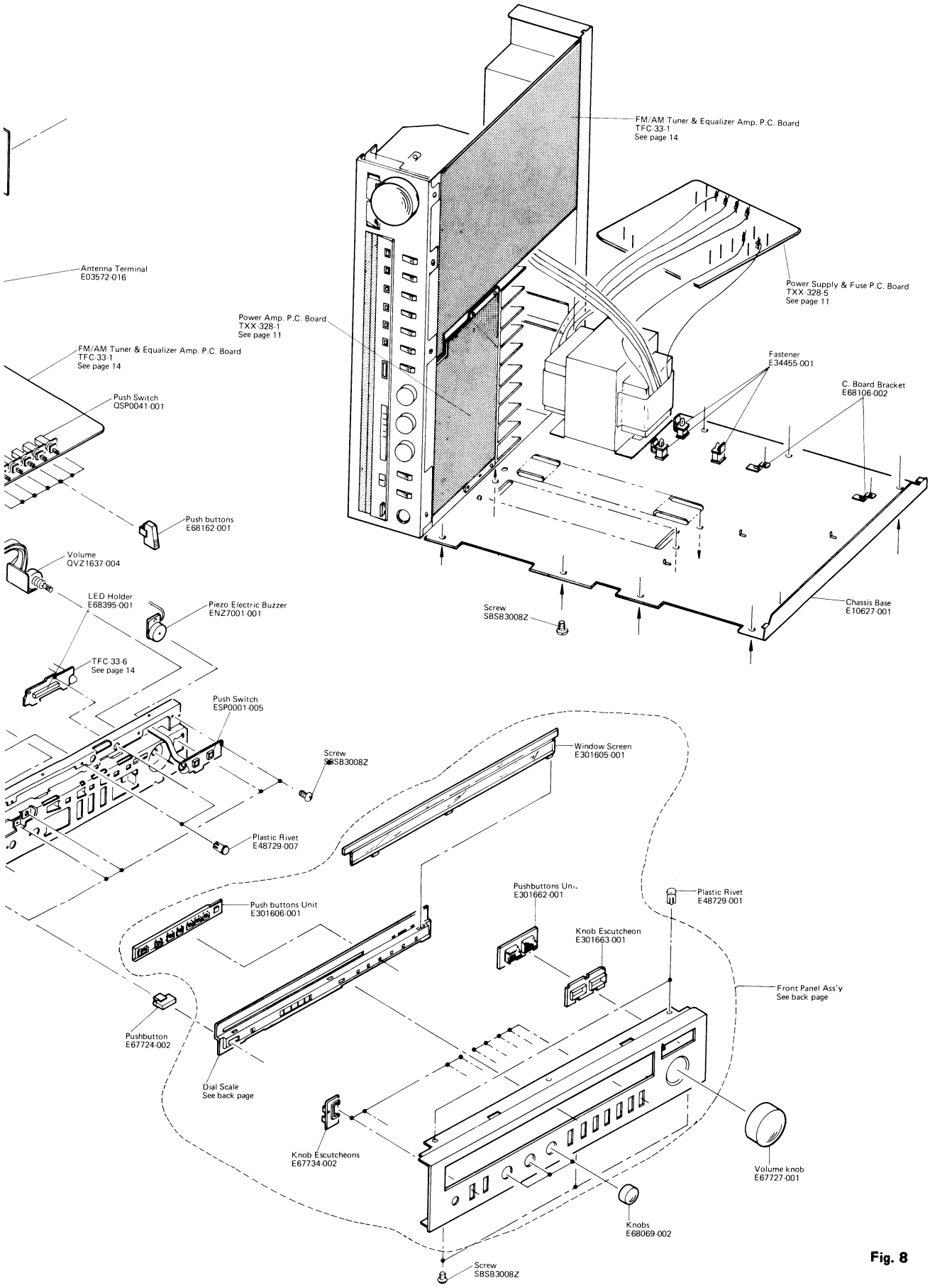

FM/AM Tuner & Equalizer Amp. P.C. Board
TFC-33-1
See page 14
Power Supply & Fuse P.C. Board
TXX-328-5
See page 11
Antenna Terminal
E03572-016
Power Amp. P.C. Board
TXX-328-1
See page 11
FM/AM Tuner & Equalizer Amp. P.C. Board
TFC-33-1
See page 14
Fastener
E34455-001
C. Board Bracket
E68106-002
Push Switch
QSP0041-001
Push buttons
E68162-001
Volume
QVZ1637-004
Screw
SBSB3008Z
Chassis Base
E10627-001
LED Holder
E68395-001
Piezo Electric Buzzer
ENZ7001-001
TFC-33-6
See page 14
Push Switch
ESP0001-005
Screw
SBSB3008Z
Window Screen
E301605-001
Plastic Rivet
E48729-007
Pushbuttons Unit
E301662-001
Plastic Rivet
E48729-001
Push buttons Unit
E301606-001
Knob Escutcheon
E301663-001
Front Panel Ass'y
See back page
Pushbutton
E67724-002
Dial Scale
See back page
Knob Escutcheons
E67734-002
Volume knob
E67727-001
Knobs
E68069-002
Screw
SBSB3008Z

Fig. 8

6. FM/AM Tuner Alignment Procedures

Alignment Location of TFC-33 FM/AM Tuner P.C. Board Ass'y

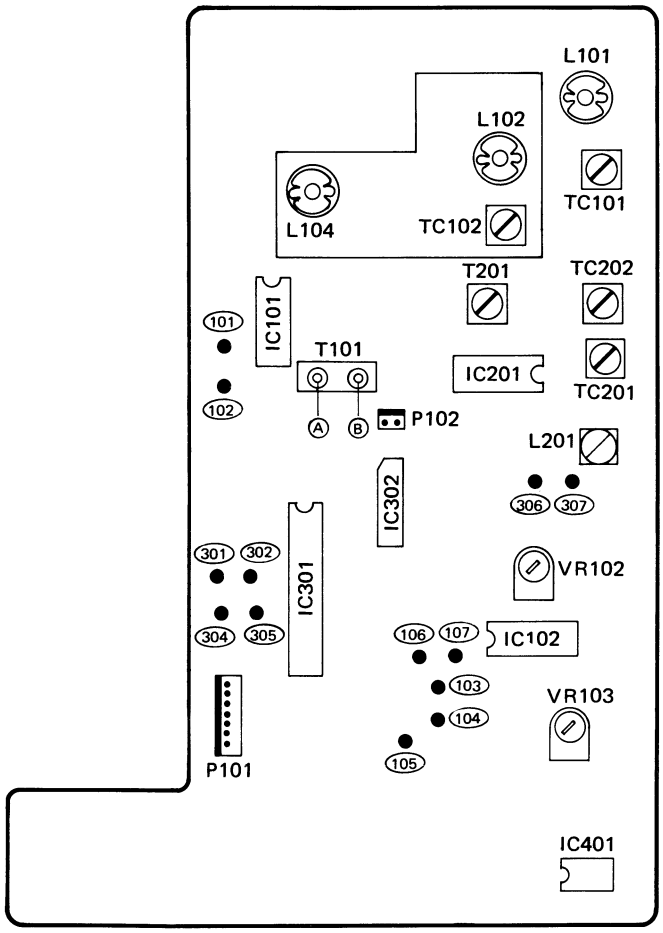


Fig. 9

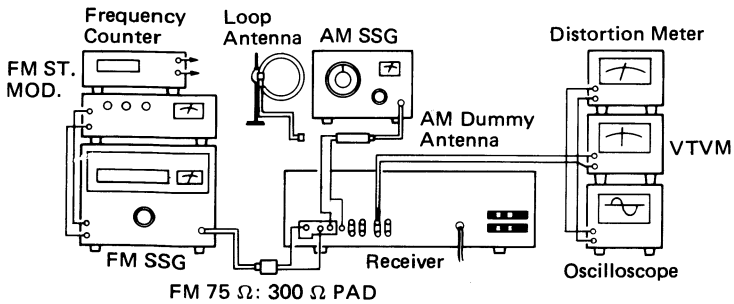


Fig. 10

6-(1) FM Section

Sensitivity

1. Connect an RF generator to 300 Ω antenna terminals on the rear panel through a dummy antenna (FM 75 Ω: 300 Ω PAD).
2. Set the RF generator to 87.5 MHz, a modulation of 1 kHz and a deviation of 75 kHz to provide an input of 1 mV.
3. Connect a VTVM and an oscilloscope to "TAPE-1/REC" jacks on the rear panel.
   Note: Set the VTVM to "1 V range" and the oscilloscope to "0.1 V/DIV".
4. Press to "FM" position.
5. Press to "MANUAL SCAN" position.
6. Set the frequency display to minimum frequency 87.5 MHz.
7. Connect a DC VTVM between TP-306 and TP-307 (GND), adjust L104 so that the DC VTVM indicates 1.8 V.
8. Set the RF generator's output to 1 mV, connect a DC VTVM between TP-101 (GND) and TP-102, adjust the core indicated arrow Ⓐ of T101 for DC VTVM reading of 0 (zero) mV.
9. Set the RF generator to 90 MHz and the RF generator's output to 100 mV, set the frequency display to 90 MHz by AUTO TUNING (UP or DOWN).
10. Set the RF generator's output to 2 μV, adjust L101 and L102 until the maximum sensitivity is obtained.
11. Set the RF generator to 106 MHz, set the frequency display to 106 MHz by AUTO TUNING (UP or DOWN).
12. Set the RF generator's output to 2 μV, adjust TC101 and TC102 until the maximum sensitivity is obtained.
13. Repeat these high and low frequency adjustment procedures alternately until maximum sensitivity is obtained.

Discriminator and Distortion

1. Connect an RF generator set to 1 kHz modulation and 75 kHz deviation to the antenna terminals on the rear panel through a dummy antenna.
2. Connect an oscilloscope, distortion meter and AC VTVM to the "TAPE-1/REC" jacks on the rear panel.
3. Set the RF generator to 98 MHz and output of 1 mV.
4. Set the frequency display to 98 MHz by AUTO TUNING (UP or DOWN).
5. Connect a DC VTVM between TP-101 (GND) and TP-102.
6. Adjust the core indicated arrow Ⓐ of T101 for DC VTVM reading of 0 (zero) mV.
7. Adjust the core indicated arrow Ⓑ of T101 so that the distortion is minimized at a value less than 0.4 %.
8. Repeat procedures "6" and "7" alternately until minimum distortion and DC VTVM reading of 0 (zero) mV are obtained.

Multiplex and Stereo Separation

Multiplex

1. Set the stereo signal generator as follows: 400 Hz modulation frequency, 75 kHz deviation pilot, 67.5 kHz main and sub carriers. Connect its output to an RF generator.
2. Connect the RF generator to the antenna terminals through a dummy antenna.
3. Connect an AC VTVM, an oscilloscope and a distortion meter to the "TAPE-1/REC" jacks on the rear panel.
4. Set the RF generator to 98 MHz and output of 1 mV.
5. Set the frequency display to 98 MHz by AUTO TUNING (UP or DOWN).
6. Connect a frequency counter and 1 MΩ resistor between TP-103 (GND) and TP-104.
   Note: Use frequency counter with input impedance of more than 1 MΩ.
7. Switch off the pilot signal of stereo modulator.
8. Adjust VR102 so that the frequency counter indicates 19 kHz (+0 ~ -50 Hz).

Stereo Separation

9. Switch the selector of stereo modulator to left channel modulation.
10. Adjust VR103 so that the output of right channel is minimized.
11. Switch the selector of the modulator to right channel modulation.
12. Adjust VR103 so that the left channel is minimized.
13. Set VR103 to an average, if the separation of left and right channels are different.

6-(2) AM Section

Tracking and Sensitivity

Note 1: ( ) for adjustment frequency of 9 kHz AM channel spacing.

Note 2: AM channel spacing of 10 kHz . . . for U.S.A., Canada and U.S. Military Market.
AM channel spacing of 9 kHz . . . for Europe, Australia, U.K. and Other Countries.

1. Press to "AM" position.
2. Connect the RF generator to the antenna terminals on the rear panel through a dummy antenna.
3. Connect an AC VTVM and an oscilloscope to the "TAPE-1/REC" jacks on the rear panel.
4. Press to "MANUAL SCAN" position.
5. Set the frequency display to minimum frequency 520 kHz (522 kHz). Connect the DC VTVM between TP-306 and TP-307 (GND), adjust L201 for DC VTVM reading of 0.93 V (0.95 V).
6. Set the frequency display to maximum frequency 1610 kHz (1602 kHz). Adjust TC201 for DC VTVM reading of 8.06 V (8.00 V).
7. Repeat procedures "5" and "6" alternately until specified voltage is obtained.
8. Set the RF generator to 600 kHz (603 kHz), a modulation of 400 Hz and modulated 30 %, to provide an output of 90 dB. (100 dB/m)
9. Release to "AUTO SCAN" position and set the frequency display to 600 kHz (603 kHz) by AUTO TUNING (UP or DOWN).
10. Set the RF generator's output to 30 dB, adjust T201 and the ferrite bar antenna adjusting the coil to maximize the output signal.
11. Set the RF generator to 1400 kHz (1404 kHz), a modulation of 400 Hz and modulated 30 %, to provide an output of 90 dB. (100 dB/m)
12. Set the frequency display to 1400 kHz (1404 kHz) by AUTO TUNING (UP or DOWN).
13. Set the RF generator's output to 30 dB (50 dB/m), adjust trimmer TC202 in the tuning gang so that the output signal is maximized.
14. Repeat these high and low frequency adjustment procedures alternately until maximum sensitivity is obtained.

7. Power Amplifier Idling Current Adjustment Procedure

Adjustment Location of TXX-328 Main Amp. P.C. Board Ass'y

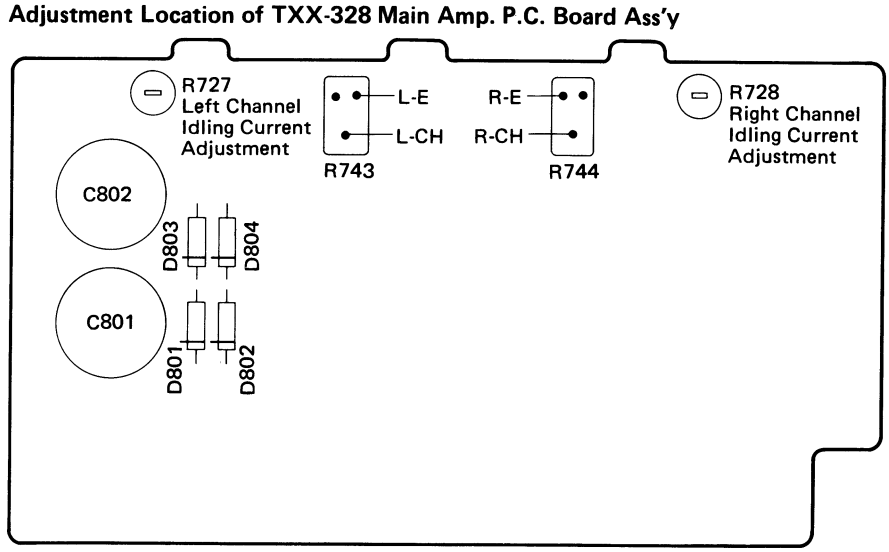


Fig. 11

Precautions:

(1) Allow the set to warm up at least 5 minutes before connecting a DC VTVM.

(2) Must keep the heatsinks cooling to prevent overheating and consequent destruction of the semiconductor junction and set the volume control to minimum during these adjustment procedures.

Procedures:

1. Turn R727 and (R728) fully counterclockwise before the power switch on.
2. Connect a DC VTVM to the Test Point L-CH and L-E (R-CH and R-E).
3. Adjust R727 (R728) for DC VTVM reading of 5 mV.

( ): for Right channel Adjustment

8. Printed Circuit Board Ass'y and Parts List

8-(1) TXX-328 : Main Amp., Power Supply and Other Functions Split P.C. Board Ass'y

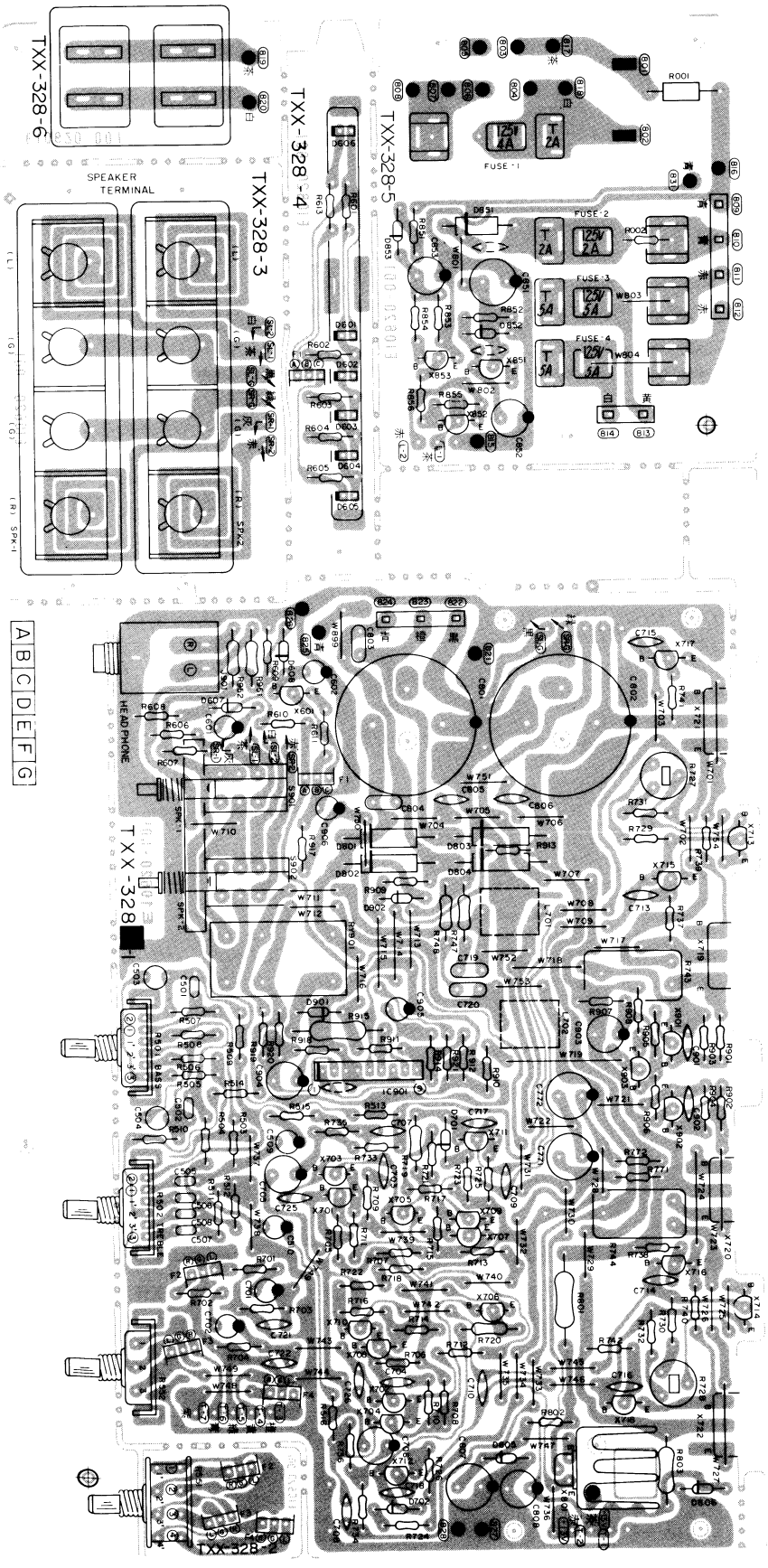


Fig. 12

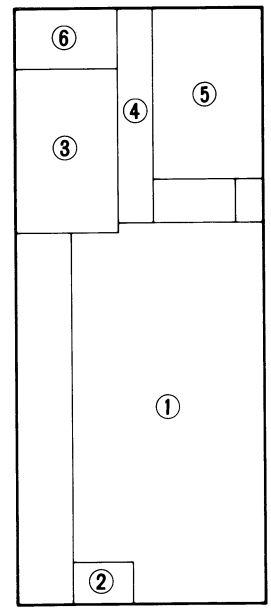


Fig. 13

Each Individual P.C. Board Location

① TXX-328□-1: Power Amplifier
② TXX-328-2: Volume
③ TXX-328-3: Speaker Terminals
④ TXX-328-4: Power Indicator L.E.D.
⑤ TXX-328□-5: Power Supply and Fuse
⑥ TXX-328□-6: AC Outlet

Note (1):
The symbols 赤, 黒, 白 on P.C. Board surface are for factory process only.

Note (2):
In □ should be indicated an area code according to the table below before placing an order.

Areas	P.C. Board
U.S.A.	TXX-328 [A] -1, -5, -6
Canada	TXX-328 [B] -1, -5, -6
U.K.	TXX-328 [EBS] -1, -5, -6
Australia & Europe	TXX-328 [D] -1, -5, -6
U.S. Military Market & Other Countries	TXX-328 [C] -1, -5, -6

Transistors

Item No.	Part Number	Rating		Description	
		Pc	fT		Maker
X601	2SC458(D)	0.2W	230 MHz	Silicon	Hitachi
X701	2SC1775AV(F)	"	200 MHz	"	"
X702	2SC1775AV(F)	"	"	"	"
X703	2SC1775AV(F)	"	"	"	"
X704	2SC1775AV(F)	"	"	"	"
X705	2SA1084(E)	0.4 W	120 MHz	"	"
X706	2SA1084(E)	"	"	"	"
X707	2SA1084(E)	"	"	"	"
X708	2SA1084(E)	"	"	"	"
X709	2SA1084(E)	"	"	"	"
X710	2SA1084(E)	"	"	"	"
X711	2SC2546(E,F)	"	90 MHz	"	"
X712	2SC2546(E,F)	"	"	"	"
X713	2SC458(C)	0.2 W	230 MHz	"	"
X714	2SC458(C)	"	"	"	"
X715	2SC2235(O,Y)	0.9 W	120 MHz	"	Toshiba
X716	2SC2235(O,Y)	"	"	"	"
X717	2SA965(O,Y)	"	"	"	"
X718	2SA965(O,Y)	"	"	"	"
X719	2SD845LB(O,R)	120 W	20 MHz	"	"
X720	2SD845LB(O,R)	"	"	"	"
X721	2SB755LB(O,R)	"	"	"	"
X722	2SB755LB(O,R)	"	"	"	"
X801	2SD313V(D,E)	30 W	8 MHz	"	Sanyo
X851	2SC945A(P,Q)	0.25 W	250 MHz	"	NEC
X852	2SA1029(C)	0.2 W	200 MHz	"	Hitachi
X853	2SC458(C)	"	230 MHz	"	"
X901	2SC1775AV(F)	"	200 MHz	"	"
X902	2SC1775AV(F)	"	"	"	"
X903	2SA872AV(E)	0.3 W	120 MHz	"	"

Integrated Circuit

Item No.	Part Number	Rating	Description	
		Pc		Maker
IC901	TA7317P	0.5 W	IC	Toshiba

Diodes

Item No.	Part Number	Rating	Description	
				Maker
D601	SR632D		L.E.D.	NEC
D602	SR632D		"	"
D603	SR632D		"	"
D604	SR632D		"	"
D605	SR632D		"	"
D606	SG232D		"	"
D607	1S2076-31	0.25 W	Silicon	Hitachi
D608	1S2076-31	"	"	"
D701	1S2076-31	"	"	"
D702	1S2076-31	"	"	"
D801	30D2FA-S		"	Nihon Inter.
D802	30D2FA-S		"	"
D803	30D2FA-S		"	"
D804	30D2FA-S		"	"
D805	RD13EB3		Silicon (Zener)	NEC
D806	RD13EB3		"	"
D851	ERB12-02RKL1		Silicon	Fuji
D852	RD6.2EB3		" (Zener)	NEC
D853	1S2076-31	0.25 W	Silicon	Hitachi
D901	1S2076-31	0.25 W	"	"
D902	1S2076-31	"	"	"

Capacitors

Item No.	Part Number	Rating		Description
C501	QFM31HK-333Z	0.033 μF	50 V	Mylar
C502	QFM31HK-333Z	"	"	"
C503	QEZ0046-224	0.22 μF	"	Electrolytic
C504	QEZ0046-224	"	"	"
C505	QFM31HK-182Z	1800 pF	"	Mylar
C506	QFM31HK-182Z	"	"	"
C507	QFM31HK-183Z	0.018 μF	"	"
C508	QFM31HK-183Z	"	"	"
C509	QET61HR-475ZM	4.7 μF	"	Electrolytic
C510	QET61HR-475ZM	"	"	"
C601	QET61HR-474ZM	0.47 μF	"	"
C602	QET61HR-225ZM	2.2 μF	"	"
C701	QET61HR-225ZM	2.2 μF	"	"
C702	QET61HR-225ZM	"	"	"
C703	QCS31HJ-331Z	330 pF	"	Ceramic
C704	QCS31HJ-331Z	"	"	"
C705	QET61AR-107ZM	100 μF	10 V	Electrolytic
C706	QET61AR-107ZM	"	"	"
C707	QCS31HJ-220Z	22 pF	50 V	Ceramic
C708	QCS31HJ-220Z	"	"	"
C709	QCY21HK-332H	3300 pF	"	"
C710	QCY21HK-332H	"	"	"
C713	QCS31HJ-181Z	180 pF	"	"
C714	QCS31HJ-181Z	"	"	"
C715	QCS31HJ-181Z	"	"	"
C716	QCS31HJ-181Z	"	"	"
C717	QCS31HJ-151Z	150 pF	"	"
C718	QCS31HJ-151Z	"	"	"
C719	QFM31HK-473Z	0.047 μF	"	Mylar
C720	QFM31HK-473Z	"	"	"
C721	QCS31HJ-121Z	120 pF	"	Ceramic
C722	QCS31HJ-121Z	"	"	"
C725	QCS31HJ-101Z	100 pF	"	"
C726	QCS31HJ-101Z	"	"	"
C771	QET51HR-107	100 μF	"	Electrolytic
C772	QET51HR-107	"	"	"
C801	QEW81HA-878	8700 μF	"	"
C802	QEW81HA-878	"	"	"
C803	QFM42AK-473	0.047 μF	100 V	Mylar
C804	QFM42AK-473	"	"	"
C805	QCF31HP-473Z	0.047 μF	50 V	Ceramic
C806	QCF31HP-473Z	"	"	"
C807	QET51CR-227	220 μF	16 V	Electrolytic
C808	QET51CR-107	100 μF	"	"
C851	QET51CR-477	470 μF	16 V	"
C852	QET51AR-477	"	10 V	"
C853	QET61ER-475Z	4.7 μF	25 V	"
C901	QCF31HP-223Z	0.022 μF	50 V	Ceramic
C902	QCF31HP-223Z	"	"	"
C903	QET61HR-226ZM	22 μF	50 V	Electrolytic
C904	QET61AR-107ZM	100 μF	10 V	"
C905	QET61CR-226ZM	22 μF	16 V	"
C906	QET61HR-105ZM	1 μF	50 V	"

Resistors

Item No.	Part Number	Rating		Description
R001	QRC121K-275EM	2.7 MΩ	1/2 W	Composlition ⚠ (for U.S.A. and Canada)
R002	QRD149J-2R2S	2.2 Ω	1/4 W	Carbon ⚠ (except for Europe, Australia and U.K.)
R501B	QVD4A2C-115	100 kΩ		Variable (Bass)
R502T	QVD4A2C-115	"		" (Treble)
R503	QRD141J-123S	12 kΩ	1/4 W	Carbon
R504	QRD141J-123S	"	"	"
R505	QRD141J-182S	1.8 kΩ	"	"

Resistors

Item No.	Part Number	Rating		Description
R506	QRD141J-182S	1.8 kΩ	1/4 W	Carbon
R507	QRD141J-823S	82 kΩ	"	"
R508	QRD141J-823S	"	"	"
R509	QRD141J-182S	1.8 kΩ	"	"
R510	QRD141J-182S	"	"	"
R511	QRD141J-681S	680 Ω	"	"
R512	QRD141J-681S	"	"	"
R513	QRD141J-472S	4.7 kΩ	"	"
R514	QRD141J-472S	"	"	"
R515	QRD141J-562S	5.6 kΩ	"	"
R516	QRD141J-562S	"	"	"
R551	QVZ1637-004	250 kΩ		Variable (Volume)
R552	QVF0A2W-6F5	"		Variable (Balance)
R601	QRD141J-222S	2.2 kΩ	1/4 W	Carbon
R602	QRD141J-561S	560 Ω	"	"
R603	QRD141J-331S	330 Ω	"	"
R604	QRD141J-181S	180 Ω	"	"
R605	QRD141J-121S	120 Ω	"	"
R606	QRD141J-561S	560 Ω	"	"
R607	QRD141J-561S	"	"	"
R608	QRD141J-560S	56 Ω	"	"
R609	QRD141J-332S	3.3 kΩ	"	"
R610	QRD141J-563S	56 kΩ	"	"
R611	QRD141J-101S	100 Ω	"	"
R613	QRD141J-561S	560 Ω	"	"
R701	QRD141J-222S	2.2 kΩ	"	"
R702	QRD141J-222S	"	"	"
R703	QRD141J-104S	100 kΩ	"	"
R704	QRD141J-104S	"	"	"
R705	QRD149J-102S	1 kΩ	"	" ⚠
R706	QRD149J-102S	"	"	" ⚠
R707	QRD149J-102S	"	"	" ⚠
R708	QRD149J-102S	"	"	" ⚠
R709	QRD141J-331S	330 Ω	"	"
R710	QRD141J-331S	"	"	"
R711	QRD141J-682S	6.8 kΩ	"	"
R712	QRD141J-682S	"	"	"
R713	QRD149J-220S	22 Ω	"	" ⚠
R714	QRD149J-220S	"	"	" ⚠
R715	QRD141J-391S	390 Ω	"	"
R716	QRD141J-391S	"	"	"
R717	QRD141J-123S	12 kΩ	"	"
R718	QRD141J-123S	"	"	"
R719	QRD129J-822	8.2 kΩ	1/2 W	" ⚠
R720	QRD129J-822	"	"	" ⚠
R721	QRD141J-123S	12 kΩ	1/4 W	"
R722	QRD141J-123S	"	"	"
R723	QRD149J-101S	100 Ω	"	" ⚠
R724	QRD149J-101S	"	"	" ⚠
R725	QRD149J-101S	"	"	" ⚠
R726	QRD149J-101S	"	"	" ⚠
R727	QVP4AOB-102	1 kΩ		Variable (Idling Current)
R728	QVP4AOB-102	"		"
R729	QRD141J-332S	3.3 kΩ	1/4 W	Carbon
R730	QRD141J-332S	"	"	"
R731	QRD141J-152S	1.5 kΩ	"	"
R732	QRD141J-152S	"	"	"
R733	QRD141J-104S	100 kΩ	"	"
R734	QRD141J-104	"	"	"
R735	QRD141J-561S	560 Ω	"	"
R736	QRD141J-561S	"	"	"
R737	QRD149J-100S	10 Ω	"	" ⚠
R738	QRD149J-100S	"	"	" ⚠
R739	QRD149J-271S	270 Ω	"	" ⚠
R740	QRD149J-271S	"	"	" ⚠
R741	QRD149J-100S	10 Ω	"	" ⚠
R742	QRD149J-100S	"	"	" ⚠
R743	ERF032K-R22	0.22 Ω	3 W	Uninflammable ⚠

Resistors

Item No.	Part Number	Rating		Description
R744	ERF032K-R22	0.22 Ω	3 W	Uninflammable ⚠
R747	QRX017J-100S	10 Ω	1 W	Oxide Metal Film ⚠
R748	QRX017J-100S	"	"	" ⚠
R771	QRD149J-100S	"	1/4 W	Carbon ⚠
R772	QRD149J-100S	"	"	" ⚠
R801	QRG027J-680	68 Ω	2 W	Oxide Metal Film ⚠
R802	QRD141J-332S	3.3 kΩ	1/4 W	Carbon
R803	QRG017J-222S	2.2 kΩ	1 W	Oxide Metal Film ⚠
R851	QRD141J-683S	68 kΩ	1/4 W	Carbon
R852	QRD141J-182S	1.8 kΩ	"	"
R853	QRD141J-153S	15 kΩ	"	"
R854	QRD141J-473S	47 kΩ	"	"
R855	QRD141J-102S	1 kΩ	"	"
R856	QRD141J-152S	1.5 kΩ	"	"
R901	QRD141J-222S	2.2 kΩ	"	"
R902	QRD141J-222S	"	"	"
R903	QRD141J-681S	680 Ω	"	"
R904	QRD141J-681S	"	"	"
R905	QRD141J-123S	12 kΩ	"	"
R906	QRD141J-123S	"	"	"
R907	QRD141J-103S	10 kΩ	"	"
R908	QRD141J-332S	3.3 kΩ	"	"
R909	QRD141J-393S	39 kΩ	"	"
R910	QRD141J-563S	56 kΩ	"	"
R911	QRD141J-183S	18 kΩ	"	"
R912	QRD141J-683S	68 kΩ	"	"
R913	QRD141J-153S	15 kΩ	"	"
R914	QRD141J-184S	180 kΩ	"	"
R915	QRG027J-391	390 Ω	2 W	Oxide Metal Film ⚠
R917	QRD141J-233S	22 kΩ	1/4 W	Carbon
R918	QRD141J-104S	100 kΩ	"	"
R919	QRD141J-104S	"	"	"
R920	QRD141J-104S	"	"	"
R921	QRD141J-563S	56 kΩ	"	"
R951	QRD129J-221	220 Ω	1/2 W	" ⚠
R952	QRD129J-221	"	"	" ⚠

Others

Item No.	Part Number	Rating	Description
	E10620-001		Circuit Board
J901	QMS6302-105	Headphones	Jack Ass'y
S901	QSP0229-057	Speaker Select	Push Switch
RY901	ESK5D24-214		Relay
	E03572-007EM	Speaker Output	Terminal Ass'y
	QMC0437-002	⚠	AC Outlet (except for Europe, Australia and U.K.)
	E300160-005		Heat Sink (for Power Transistors)
	E61537-005		Heat Sink (for X801)
	E300107-003		C. Borad Holder (for Left Side)
	E300107-004		C. Board Holder (for Right Side)
	E301611-001		L.E.D. Holder
	E45524-002		Fuse Clip (for U.S.A. and Canada)
	E48965-002		Fuse Clip (for Europe, Australia and U.K.)
	EWS012-054	2 Pins	Socket Wire Ass'y
	EWS017-030	7 Pins	"
	E33754-003		Tie Band
	E43727-002		Tab
	SBSE3012N		Screw (for Power Transistors)
L701	E04059-1R0	1 μH	Choke Coil
L702	E04059-1R0	"	"

8-(2) TFC-33 : FM/AM Synthesized Tuner, Equalizer Amp. and Other Functions Split P.C. Board Ass'y

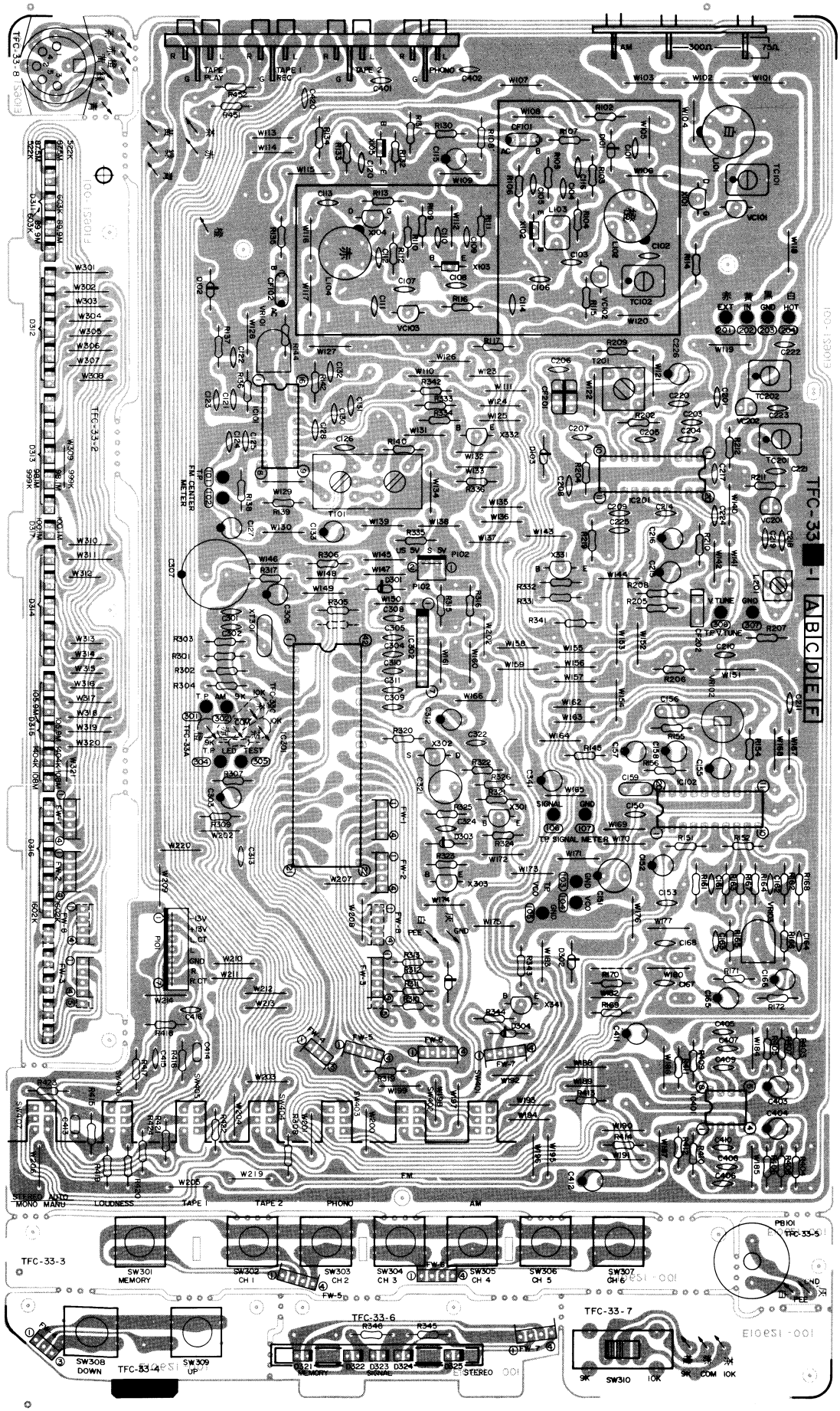


Fig. 14

Each Individual P.C. Board Location

① TFC-33□-1: FM/AM Tuner & Equalizer Amp.
② TFC-33-2: Frequency Display L.E.D.
③ TFC-33-3: Preset/Station Select Switch & Memory Switch
④ TFC-33-4: Up/Down Scan Switch
⑤ TFC-33-5: Buzzer
⑥ TFC-33-6: Memory, Signal and FM Stereo Indicator L.E.D.
⑦ TFC-33□-7: AM Channel Space Select Switch
⑧ TFC-33□-8: DIN Socket

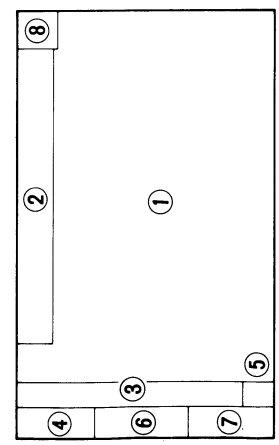


Fig. 15

Transistors

Item No.	Part Number	Rating		Description	
		Pc	fT		Maker
X101	2SK168(F)	0.2 W		F.E.T.	Hitachi
X102	2SC535(C)	0.1 W	940 MHz	Silicon	"
X103	2SC461(B,C)	0.2 W	230 MHz	"	"
X104	2SK168(E)	"		F.E.T.	"
X105	2SC461(C)	"	230 MHz	Silicon	"
X301	2SC945A(P,Q)	0.25 W	250 MHz	"	NEC
X302	2SK105(F)	"		F.E.T.	"
X303	2SC458(D)	0.2 W	230 MHz	Silicon	Hitachi
X331	2SC945A(P,Q)	0.25 W	250 MHz	"	NEC
X332	2SC945A(P,Q)	"	"	"	"
X341	2SC458(D)	0.2 W	230 MHz	"	Hitachi

Integrated Circuits

Item No.	Part Number	Rating	Description	
		Pc		Maker
IC101	LA1235	0.65 W		Sanyo
IC102	LA3390	0.55 W		"
IC201	LA1245	0.7 W		"
IC301	TC9136P	0.8 W		Toshiba
IC302	TD6104P	0.2 W		"
IC401	NJM4558D-D	0.5 W		JRC

Diodes

Item No.	Part Number	Rating	Description	
				Maker
D101	1S188FM		Ge	Sanyo
D102	1S2076-31	0.25 W	Silicon	Hitachi
D103	1S2076-31	"	"	"
D301	1S2076-31	"	"	"
D302	1S2076-31	"	"	"
D303	1S2076-31	"	"	"
D304	RD8.2EB3		Silicon (Zener)	NEC
D311	SLP-152D		L.E.D.	Sanyo
D312	SLP-152D		"	"
D313	SLP-152D		"	"
D314	SLP-152D		"	"
D315	SLP-152D		"	"
D316	SLP-152D		"	"
D317	SLP-151D		"	"
D321	SR535D		"	NEC
D323	SG235D		"	"
D324	SG235D		"	"
D325	SG235D		"	"
D326	SY435D		"	"

Coils & Transformers

Item No.	Part Number	Rating	Description
L101	EQR2306-014		RF Coil
L102	E03477-64		"
L103	E03522-1R5KY		Choke Coil
L104	E03477-050		RF Coil
L201	EQR1207-001		"
T101	EQT2140-003		FM DET. Transformer
T201	E03613-017		AM IF. Transformer

Capacitors

Item No.	Part Number	Rating		Description
C101	QCF31HP-103Z	0.01 μF	50 V	Ceramic
C102	QCS31HJ-5R0Z	5 pF	"	"
C103	QCS31HJ-5R0Z	"	"	"
C104	QCS31HJ-151Z	150 pF	"	"
C105	QCF31HP-103Z	0.01 μF	"	"
C106	QCS31HJ-3R0Z	3 pF	"	"
C107	QCS31HJ-7R0Z	7 pF	"	"
C108	QCS31HJ-220Z	22 pF	"	"
C109	QCS31HJ-100Z	10 pF	"	"
C110	QCF31HP-103Z	0.01 μF	"	"
C111	QCT25UJ-100Z	10 pF	"	"
C112	QCS31HJ-2R0Z	2 pF	"	"
C113	QCF31HP-103Z	0.01 μF	"	"
C114	QCF31HP-223Z	0.022 μF	"	"
C116	QCF31HP-223Z	"	"	"
C120	QCF31HP-223Z	"	"	"
C121	QCF31HP-223Z	"	"	"
C122	QCF31HP-223Z	"	"	"
C123	QCF31HP-223Z	"	"	"
C124	QCS31HJ-121Z	120 pF	"	"
C125	QCF31HP-223Z	0.022 μF	"	"
C126	QCF31HP-223Z	"	"	"
C127	QET61HR-105ZM	1 μF	"	Electrolytic
C128	QCF31HP-223Z	0.022 μF	"	Ceramic
C130	QCF31HP-223Z	"	"	"
C131	QCF31HP-223Z	"	"	"
C132	QCF31HP-223Z	"	"	"
C133	QET61HR-475ZM	4.7 μF	"	Electrolytic
C150	QCF31HP-223Z	0.022 μF	"	Ceramic
C151	QET61CR-107ZM	100 μF	16 V	Electrolytic
C152	QET61HR-475ZM	4.7 μF	50 V	"
C153	QCF31HP-473Z	0.047 μF	"	Ceramic
C155	QET61HR-105ZM	1 μF	"	Electrolytic
C156	QFP31HJ-102	1000 pF	"	Polypropyrene
C157	QEB51EM-335	3.3 μF	25 V	Low Leak Current Electrolytic
C158	QEB51EM-225	2.2 μF	"	"
C159	QFM31HK-473Z	0.047 μF	50 V	Mylar
C161	QCS31HJ-471Z	470 pF	"	Ceramic (for Europe, Australia and U.K.)
C161	QCS31HJ-681Z	680 pF	"	Ceramic (for All Other Countries)
C162	QCS31HJ-471Z	470 pF	"	Ceramic (for Europe, Australia and U.K.)
C162	QCS31HJ-681Z	680 pF	"	Ceramic (for All Other Countries)
C163	QCF31HP-103Z	0.01 μF	"	Ceramic
C164	QCF31HP-103Z	"	"	"
C165	QET61HR-475ZM	4.7 μF	"	Electrolytic
C166	QET61HR-475ZM	"	"	"
C167	QCY31HK-682Z	6800 pF	"	Ceramic
C168	QCY31HK-682Z	"	"	"
C201	QCF31HP-223Z	0.022 μF	"	"
C203	QCY31HK-102Z	1000 pF	"	"
C204	QCF31HP-223Z	0.022 μF	"	"
C205	QCF31HP-223Z	"	"	"
C206	QCS31HJ-560Z	56 pF	"	"
C207	QCF31HP-223Z	0.022 μF	"	"
C208	QCY31HK-102Z	1000 pF	"	"
C209	QCF31HP-223Z	0.022 μF	"	"
C210	QCY31HK-472Z	4700 pF	"	"
C211	QCF31HP-223Z	0.022 μF	"	"
C214	QCF31HP-223Z	"	"	"
C215	QET61HR-105ZM	1 μF	"	Electrolytic
C216	QET61HR-475ZM	4.7 μF	"	"
C217	QCF31HP-223Z	0.022 μF	"	Ceramic

Capacitors

Item No.	Part Number	Rating		Description
C218	QCS31HJ-221Z	220 pF	50 V	Ceramic
C219	QCS31HJ-221Z	"	"	"
C220	QCF31HP-223Z	0.022 μF	"	"
C221	QCS31HJ-150Z	15 pF	"	"
C222	QCS31HJ-5R0Z	5 pF	"	"
C223	QCF31HP-223Z	0.022 μF	"	"
C224	QCF31HP-223Z	"	"	"
C225	QCF31HP-223Z	"	"	"
C226	QET61CR-226ZM	22 μF	16 V	Electrolytic
C301	QCS31HJ-100Z	10 pF	50 V	Ceramic
C302	QCS31HJ-100Z	"	"	"
C303	QET61HR-105ZM	1 μF	"	Electrolytic
C304	QCF31HP-223Z	0.022 μF	"	Ceramic
C305	QCF31HP-223Z	"	"	"
C306	QET61AR-107ZM	100 μF	10 V	Electrolytic
C307	QET50JR-228H	2200 μF	6.3 V	"
C308	QCF31HP-223Z	0.022 μF	50 V	Ceramic
C309	QCF31HP-103Z	0.01 μF	"	"
C310	QCF31HP-223Z	0.022 μF	"	"
C311	QCF31HP-103Z	0.01 μF	"	"
C312	QET61AR-107ZM	100 μF	10 V	Electrolytic
C313	QCF31HP-103Z	0.01 μF	50 V	Ceramic
C321	QEZ0046-105	1 μF	"	Electrolytic
C322	QCF31HP-223Z	0.022 μF	"	Ceramic
C341	QET61AR-476ZM	47 μF	10 V	Electrolytic
C401	QCF31HP-223Z	0.022 μF	50 V	Ceramic
C402	QCF31HP-223Z	"	"	"
C403	QET61HR-475ZM	4.7 μF	"	Electrolytic
C404	QET61HR-475ZM	"	"	"
C405	QCY31HK-182Z	1800 pF	"	Ceramic
C406	QCY31HK-182Z	"	"	"
C407	QCY31HK-682Z	6800 pF	"	"
C408	QCY31HK-682Z	"	"	"
C409	QCS31HJ-560Z	56 pF	"	"
C410	QCS31HJ-560Z	"	"	"
C411	QET61HR-105ZM	1 μF	"	Electrolytic
C412	QET61HR-105ZM	"	"	"
C413	QFM31HK-183Z	0.018 μF	"	Mylar
C414	QFM31HK-183Z	"	"	"
C415	QCS31HJ-151Z	150 pF	"	Ceramic
C416	QCS31HJ-151Z	"	"	"

Note (1):
The symbols 赤, 黒, 白 on P.C. Board surface are for factory process only.

Note (2):
In □ should be indicated an area code according to the table below before placing an order.

Areas	P.C. Board
U.S.A. and Canada	TFC-33 [A] -1, -7, -8
U.K., Australia and Europe	TFC-33 [B] -1, -7, -8
U.S. Military Market & Other Countries	TFC-33 [C] -1, -7, -8

Resistors

Item No.	Part Number	Rating		Description
R102	QRD141J-221S	220 Ω	1/4 W	Carbon
R103	QRD141J-153S	15 kΩ	"	"
R104	QRD141J-472S	4.7 kΩ	"	"
R105	QRD141J-102S	1 kΩ	"	"
R106	QRD141J-101S	100 Ω	"	"
R107	QRD141J-561S	560 Ω	"	"
R108	QRD141J-221S	220 Ω	"	"
R109	QRD141J-103S	10 kΩ	"	"
R110	QRD141J-682S	6.8 kΩ	"	"
R111	QRD141J-222S	2.2 kΩ	"	"
R112	QRD141J-105S	1 MΩ	"	"
R113	QRD141J-101S	100 Ω	"	"
R114	QRD141J-473S	47 kΩ	"	"
R115	QRD141J-473S	"	"	"
R116	QRD141J-392S	3.9 kΩ	"	"
R117	QRD141J-103S	"	"	"
R130	QRD141J-101S	100 Ω	"	"
R131	QRD141J-273S	27 kΩ	"	"
R132	QRD141J-103S	10 kΩ	"	"
R133	QRD141J-561S	560 Ω	"	"
R134	QRD141J-561S	"	"	"
R135	QRD141J-101S	100 Ω	"	"
R136	QRD141J-391S	390 Ω	"	"
R137	QRD141J-103S	10 kΩ	"	"
R138	QRD141J-561S	560 Ω	"	"
R139	QRD141J-153S	15 kΩ	"	"
R140	QRD141J-332S	3.3 kΩ	"	"
R142	QRD141J-273S	27 kΩ	"	"
R144	QRD141J-103S	10 kΩ	"	"
R145	QRD141J-104S	100 kΩ	"	"
R151	QRD141J-104S	"	"	"
R152	QRD141J-184S	180 kΩ	"	"
R154	QRD141J-561S	560 Ω	"	"
R155	QRD141J-153S	15 kΩ	"	"
R156	QRD141J-102S	1 kΩ	"	"
R157	QRD141J-103S	10 kΩ	"	"
R161	QRD141J-823S	82 kΩ	"	"
R162	QRD141J-823S	"	"	"
R163	QRD141J-224S	220 kΩ	"	"
R164	QRD141J-224S	"	"	"
R165	QRD141J-102S	1 kΩ	"	"
R167	QRD141J-100S	10 Ω	"	"
R168	QRD141J-100S	"	"	"
R169	QRD141J-472S	4.7 kΩ	"	"
R170	QRD141J-472S	"	"	"
R171	QRD141J-182S	1.8 kΩ	"	"
R172	QRD141J-182S	"	"	"
R202	QRD141J-152S	1.5 kΩ	"	"
R204	QRD141J-331S	330 Ω	"	"
R205	QRD141J-103S	10 kΩ	"	"
R206	QRD141J-123S	12 kΩ	"	"
R207	QRD141J-332S	3.3 kΩ	"	"
R208	QRD141J-820S	82 Ω	"	"
R209	QRD141J-331A	330 Ω	"	"
R210	QRD141J-103S	10 kΩ	"	"
R211	QRD141J-473S	47 kΩ	"	"
R212	QRD141J-103S	10 kΩ	"	"
R219	QRD141J-101S	100 Ω	"	"
R301	QRD141J-104S	100 kΩ	"	"
R302	QRD141J-273S	27 kΩ	"	"
R303	QRD141J-104S	100 kΩ	"	"
R304	QRD141J-273S	27 kΩ	"	"
R305	QRD141J-104S	100 kΩ	"	"
R306	QRD141J-222S	2.2 kΩ	"	"
R307	QRD141J-683S	68 kΩ	"	"
R308	QRD141J-154S	150 kΩ	"	"
R309	QRD141J-104S	100 kΩ	"	"
R310	QRD141J-181S	180 Ω	"	"
R311	QRD141J-181S	"	"	"
R312	QRD141J-181S	"	"	"

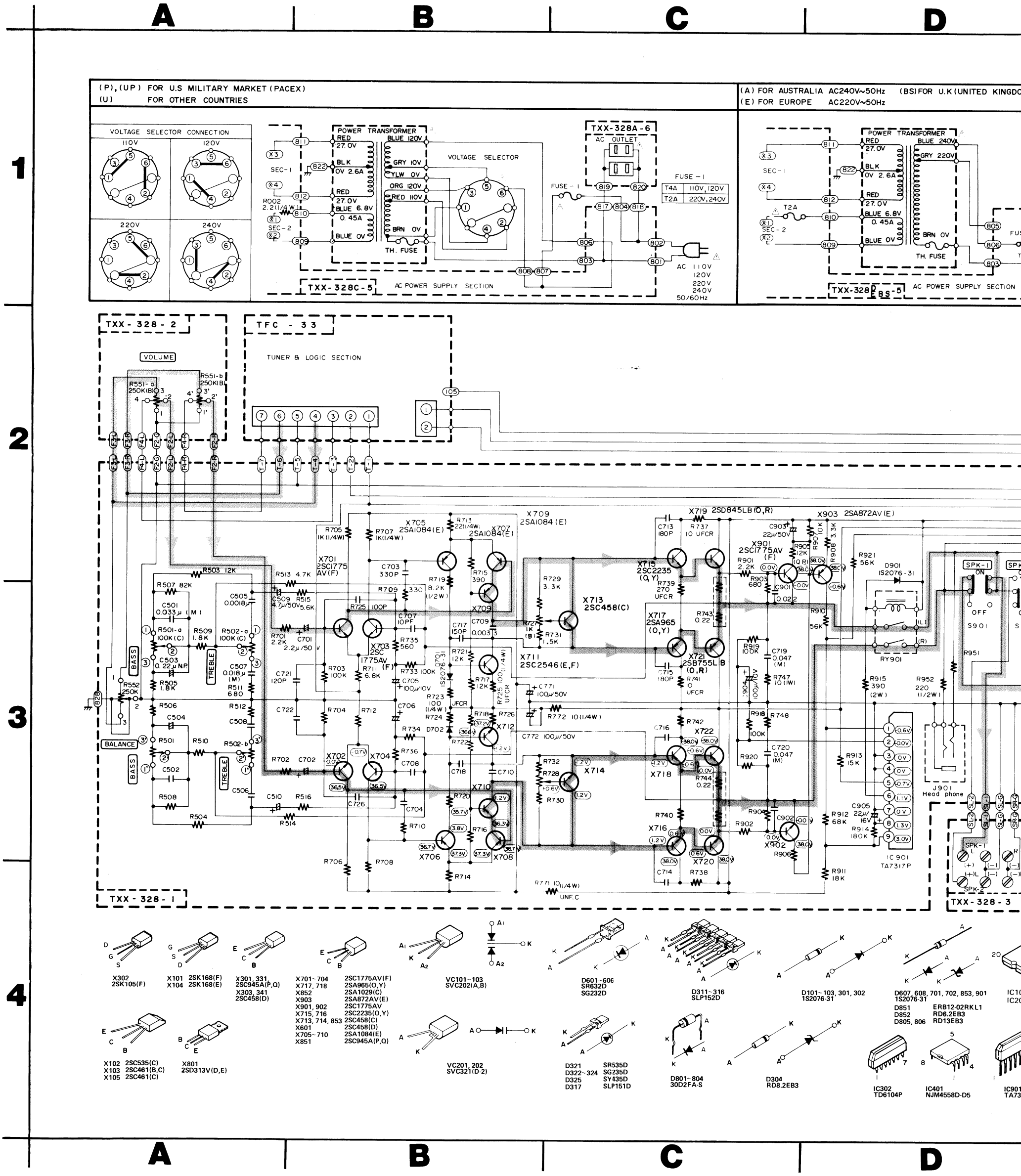
Resistors

Item No.	Part Number	Rating		Description
R313	QRD141J-181S	180 Ω	1/4 W	Carbon
R315	QRD141J-103S	10 kΩ	"	"
R316	QRD141J-103S	10 kΩ	"	"
R317	QRD141J-102S	1 kΩ	"	"
R319	QRD141J-221S	220 Ω	"	"
R320	QRD141J-472S	4.7 kΩ	"	"
R322	QRD141J-681S	680 Ω	"	"
R323	QRD141J-331S	330 Ω	"	"
R324	QRD141J-682S	6.8 kΩ	"	"
R325	QRD141J-102S	1 kΩ	"	"
R326	QRD141J-823S	82 kΩ	"	"
R331	QRD141J-472S	4.7 kΩ	"	"
R332	QRD141J-332S	3.3 kΩ	"	"
R333	QRD141J-563S	56 kΩ	"	"
R334	QRD141J-563S	"	"	"
R335	QRD141J-153S	15 kΩ	"	"
R336	QRD141J-223S	22 kΩ	"	"
R341	QRD141J-562S	5.6 kΩ	"	"
R342	QRD141J-472S	4.7 kΩ	"	"
R343	QRD141J-220S	22 Ω	"	"
R344	QRD141J-151S	150 Ω	"	"
R345	QRD141J-121S	120 Ω	"	"
R346	QRD141J-331S	330 Ω	"	"
R347	QRD141J-562S	5.6 kΩ	"	"
R403	QRD141J-222S	2.2 kΩ	"	"
R404	QRD141J-222S	"	"	"
R405	QRD141J-563S	56 kΩ	"	"
R406	QRD141J-563S	"	"	"
R407	QRD141J-751S	750 Ω	"	"
R408	QRD141J-751S	"	"	"
R409	QRD141J-393S	39 kΩ	"	"
R410	QRD141J-393S	"	"	"
R411	QRD141J-474S	470 kΩ	"	"
R412	QRD141J-474S	"	"	"
R413	QRD141J-104S	100 kΩ	"	"
R414	QRD141J-104S	"	"	"
R415	QRD141J-683S	68 kΩ	"	"
R416	QRD141J-683S	"	"	"
R417	QRD141J-564S	560 kΩ	"	"
R418	QRD141J-564S	"	"	"
R419	QRD141J-223S	22 kΩ	"	"
R420	QRD141J-223S	"	"	"
R421	QRD141J-332S	3.3 kΩ	"	"
R422	QRD141J-332S	"	"	"
R423	QRD141J-332S	"	"	"
R424	QRD141J-332S	"	"	"
R451	QRD141J-124S	120 kΩ	"	" (for Europe, Australia and U.K.)
R452	QRD141J-124S	"	"	" (")

Others

Item No.	Part Number	Rating	Description
P101	QMV5005-007	7 Pins	Plug Ass'y
P102	QMV5005-002	2 Pins	"
CF101	E03357-013(R)	1/2 PC028	FM Ceramic Filter (for All Other Countries)
CF101	E03357-014(R)	1/2 PC029	FM Ceramic Filter (for Europe, Australia and U.K.)
CF102	E03357-013(R)	1/2 PC028	FM Ceramic Filter (for All Other Countries)
CF102	E03357-014(R)	1/2 PC029	FM Ceramic Filter (for Europe, Australia and U.K.)
CF201	E03613-019		AM Ceramic Filter
CF202	E03613-022		"
PB301	ENZ7001-001		Ceramic Buzzer
PHTP2	EMN00TV-401A		Pin Jack
SW401	QSP0041-001	Source Select	Push Switch
SW402	QSP0041-001	"	"
SW403	QSP0041-001	"	"
SW404	QSP0041-001	"	"
SW405	QSP0041-001	"	"
SW406	QSP0041-001	"	"
SW407	QSP0041-001	"	"
SW301	ESP0001-005	Channel Tact	"
SW302	ESP0001-005	"	"
SW303	ESP0001-005	"	"
SW304	ESP0001-005	"	"
SW305	ESP0001-005	"	"
SW306	ESP0001-005	"	"
SW307	ESP0001-005	"	"
SW308	ESP0001-005	Scan	"
SW309	ESP0001-005	"	"
SW310	QSS2201-002	9 kHz/10 kHz Select	Slide Switch (except for Europe, Australia and U.K.)
TAPE1	EMN00TV-401A		Pin Jack
TC101	QAT2001-001		Trimmer Capacitor
TC102	QAT2001-001		"
TC201	QAT2001-005		"
TC202	QAT2001-005		"
VC101	SVC202(AB)		Variable Capacitance Diode
VC102	SVC202(AB)		"
VC103	SVC202(AB)		"
VC201	SVC321(D-2)		"
VC202	SVC321(D-2)		"
VR102	QVP4A0B-472	Free Run	Variable Resistor (4.7 kΩ)
VR103	QVP8A0B-024M	Separation	" (20 kΩ)
XT301	ECX0007-200KA		X'tal Resonator
	EWR33A-20NN		Flat Wire
	EWR34A-15NN		"
	EWR34A-20NN		"
	E03572-016		Antenna Terminal
	E03623-003		DIN Socket (for Europe, Australia and U.K.)
	E10621-001		Circuit Board
	E43727-002		Tab
	E66724-001		Shield Cover
	E68395-001		L.E.D. Holder

9. R-2X Schematic Diagram



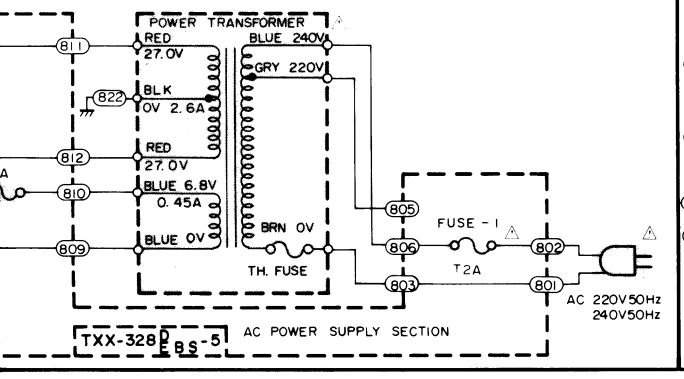
Printed Circuit Board Ass'y Locations

P.C. Board Ass'y	Description	Page
TXX-328	Main Amp., Power Supply and Other Functions Split P.C. Board Ass'y	11
TFC-33	FM/AM Synthesized Tuner, Equalizer Amp. and Other Functions Split P.C. Board Ass'y	14

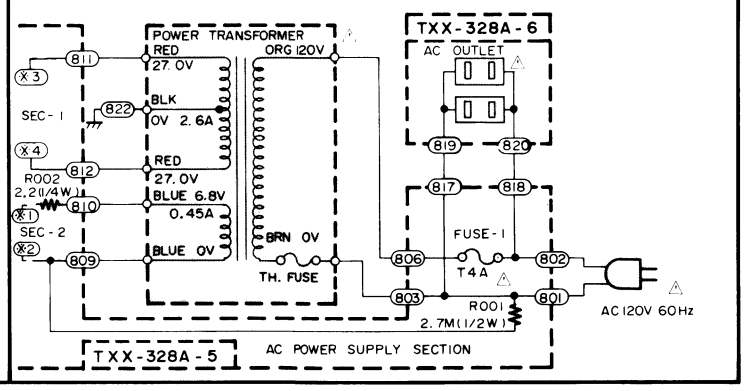
Notes:

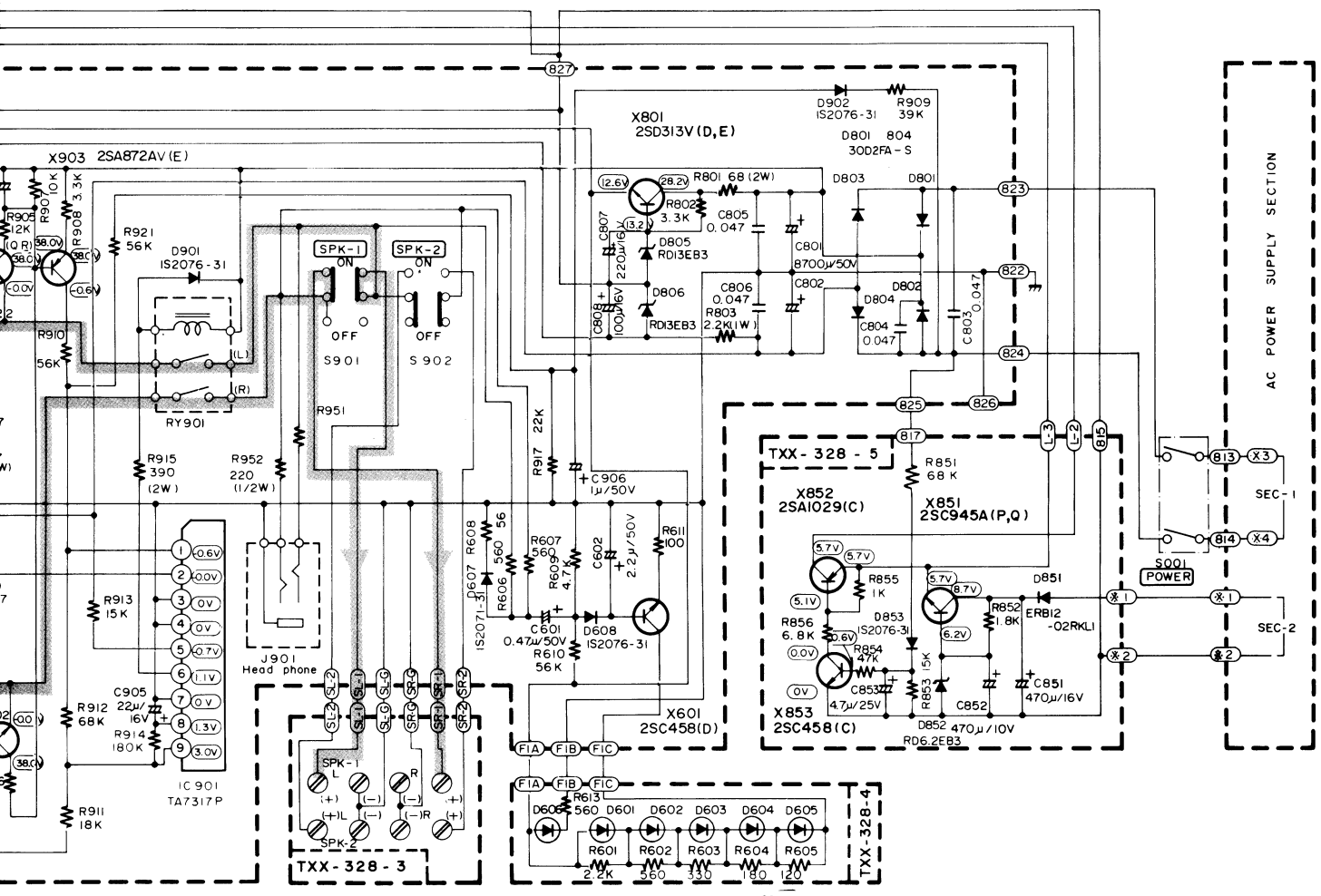
1. ⬭ shows DC voltage to the chassis with no signal input.
2. Voltage values in ▭ are positive.
3. Voltage values in ▭ are negative.
4. —— indicates positive B power supply.
5. —— indicates negative B power supply.
6. ▒ indicates signal path.
7. When replacing the parts in the darkned those marked with ⚠, be sure to use the to ensure safety.
   Parts in red indicate transistors or ICs.
8. This is the standard circuit diagram.
9. The design and contents are subject to notice.

TRALIA AC240V~50Hz (BS)FOR U.K(UNITED KINGDOM) AC240V~50Hz
ROPE AC220V~50Hz



(J) FOR U.S.A AC120V~60Hz
(C) FOR CANADA AC120V~60Hz

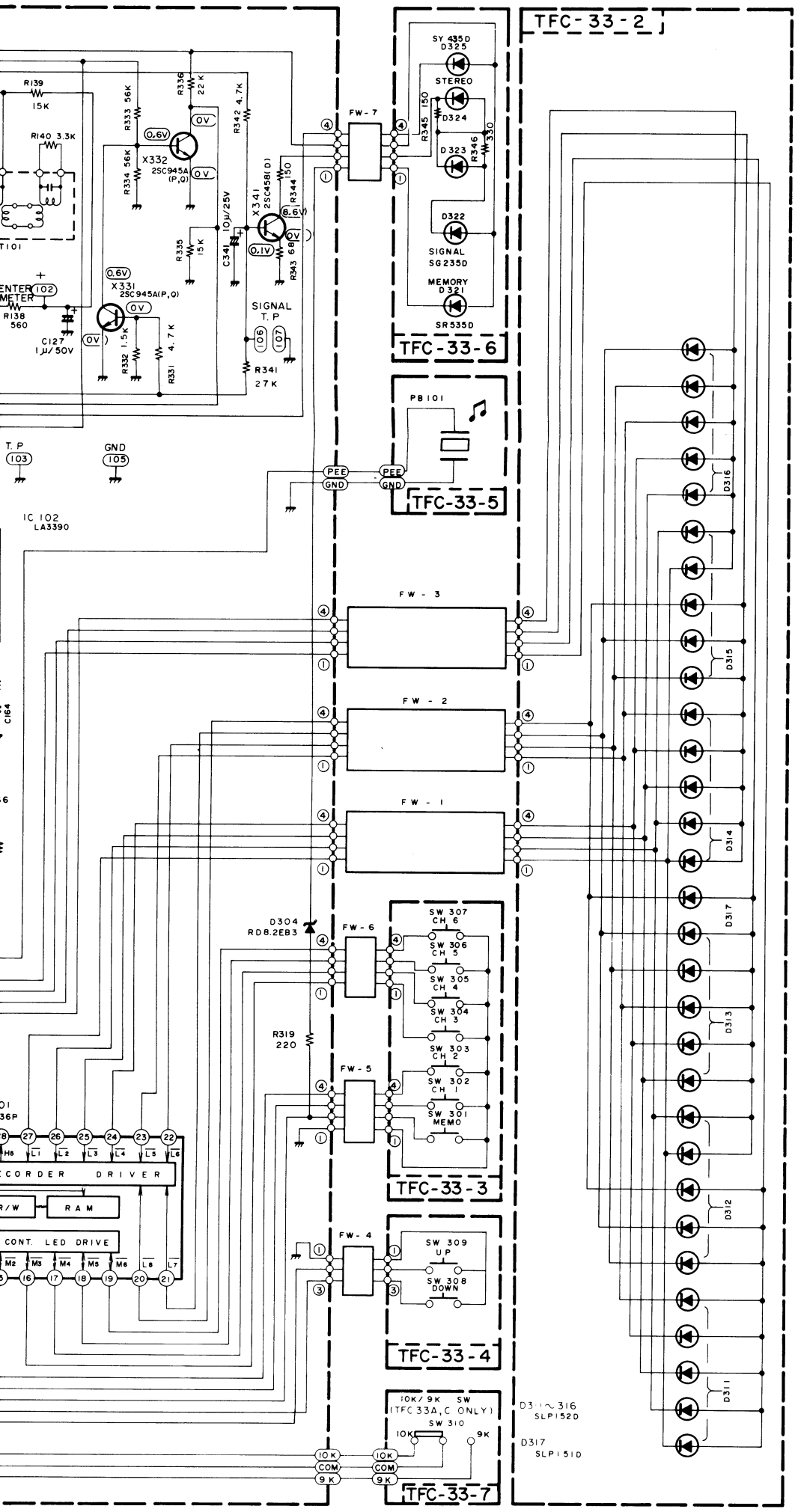




7. When replacing the parts in the darkned area (▒▒) and those marked with ⚠, be sure to use the designated parts to ensure safety.
   Parts in red indicate transistors or ICs.
8. This is the standard circuit diagram.
9. The design and contents are subject to change without notice.

		C161,162
TFC-33A	J, C	75μS 680P
B	E, A, BS	50μS 470P
C	U, P	75μS 680P

R-2X
No. 2563



PIN	IC101	IC102	IC201	IC301	IC302	IC401
1	2.61	12.59	0.1	0	5.60	11.97
2	2.61	4.37	0.59	5.05	5.60	6.87
3	2.61	4.37	0.97	5.32	4.73	6.97
4	0	0.22	0	5.55	0	1.55
5	0	0.01	1.46	5.55	4.15	0.97
6	6.24	0.52	1.32	1.17	4.16	0.87
7	6.11	4.31	1.46	5.27	0.01	11.97
8	6.18	5.13	1.46	0		12.59
9	6.17	4.31	2.85	4.85		
10	6.19	5.11	10.28	5.31		
11	12.59	3.61	0.69	5.31		
12	6.19	0	0	0.02		
13	0.08	11.15	2.17	5.60		
14	0	2.27	12.59	5.27		
15	0.35	2.27	1.70	5.27		
16	0.38	2.11	0.02	5.27		
17		2.27	4.01	5.27		
18		2.27	1.43	5.27		
19		4.03	1.43	5.27		
20		2.27	0.01	2.31		
21				2.31		
22				2.69		
23				2.28		
24				2.23		
25				2.36		
26				1.91		
27				2.24		
28				1.57		
29				1.93		
30				1.86		
31				2.07		
32				1.87		
33				1.71		
34				1.10		
35				0		
36				0		
37				5.07		
38				0		
39				5.08		
40				0		
41				5.33		
42				5.33		

FM POSITION

PIN	IC101	IC102	IC201	IC301	IC302	IC401
1	2.43	12.59	5.38	0	5.60	11.97
2	1.59	4.37	2.15	4.97	4.98	0.87
3	2.43	4.37	2.74	5.22	4.75	0.97
4	0	4.35	0	1.17	0	1.55
5	0	0.06	8.88	1.17	4.13	0.97
6	6.25	1.45	2.06	3.74	4.13	0.87
7	6.10	4.31	9.59	5.18	0.09	11.97
8	6.18	5.51	9.59	0		12.59
9	6.19	4.31	2.80	4.85		
10	6.19	5.14	8.53	5.21		
11	12.59	12.59	0.68	5.21		
12	6.19	0	0	0.02		
13	0.02	11.15	2.15	5.59		
14	0	2.29	12.59	5.18		
15	0.21	2.29	1.67	5.18		
16	0.25	0.13	0.02	5.18		
17		2.29	2.12	5.18		
18		2.28	5.40	5.18		
19		2.29	5.40	5.18		
20		3.93	2.64	1.83		
21				0.97		
22				0.91		
23				0.84		
24				0.88		
25				0.94		
26				0.90		
27				0.93		
28				0.55		
29				0.82		
30				0.85		
31				0.83		
32				1.73		
33				1.45		
34				1.10		
35				0		
36				0		
37				4.97		
38				0		
39				4.97		
40				0		
41				5.03		
42				5.03		

AM POSITION

TR. VOLTAGES ARE MEASURED WITH DC V.T.V.M. AT FM POSITION NON SIGNAL.

10. Packing Materials and Part Numbers

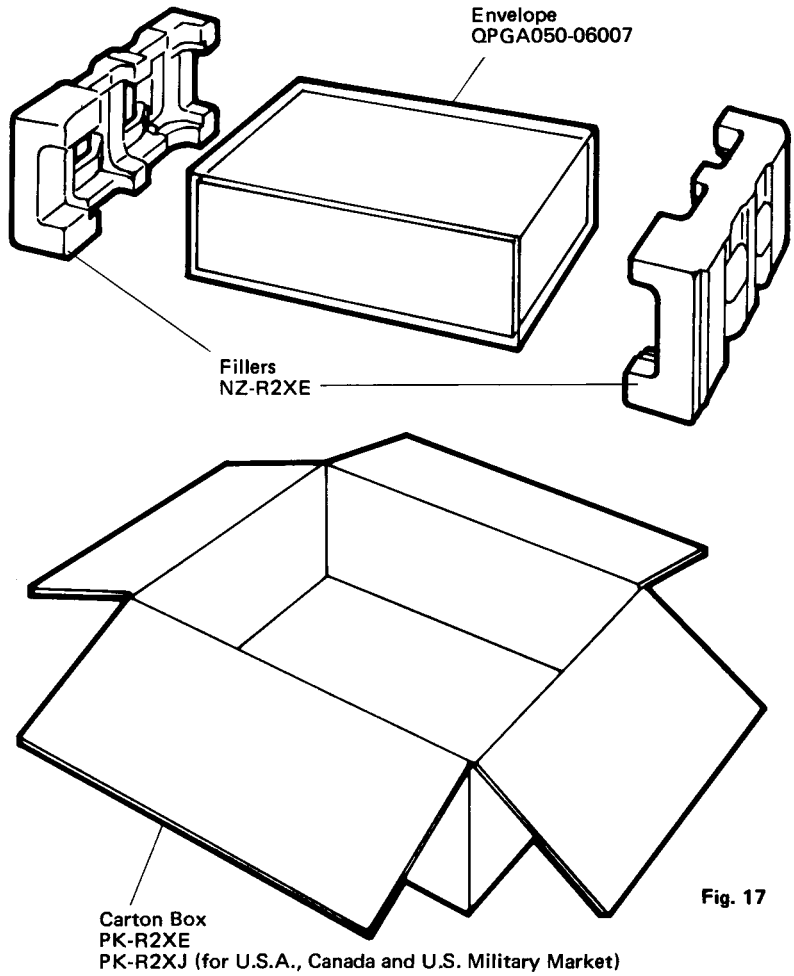


Fig. 17

11. Accessories List

Item No.	Part Number	Description	Q'ty
1	E30580-913A	Instruction Book	1
2	See back page	Warranty Card	1
3	E03614-004	FM Antenna	1
4	BT20046	Service Information Card (for U.S.A. only)	1
5	QPGA025-03505	Envelope for Instruction Book	1
6	See back page	Siemens Plug	1

12. Parts List with Specified Numbers for Designated Areas

Page	Item No.	Description	U.S.A. and Canada	U.K.	Australia and Europe	U.S. Military Market and Other Countries
6	4-(3)	Power Transformer ⚠	ETP1150-02JA (U.S.A.) ETP1150-02CA (Canada)	ETP1150-02EABS	ETP1150-02EA	ETP1150-02FA
6	4-(2)	Voltage Selector ⚠	–	–	–	QSR0085-001U
6	4-(2)	Fuse Holder ⚠	–	–	–	QMG0301-003
6	4-(3)	Fuse-Primary ⚠ (Fuse-1)	QMF61U1-4R0	QMF51A2-2R0LBS	QMF51A2-2R0L	QMF51A2-4R0S QMF51A2-2R0L
6	4-(3)	Fuse-Secondary ⚠ (Fuse-2)	–	QMF51A2-2R0LBS	QMF51A2-2R0L	–
6	4-(2)	Power Cord ⚠	QMP1200-200	QMP9017-008BS	QMP2560-244 (Australia) QMP3900-200 (Europe)	QMP7600-250
6	4-(2)	Cord Stopper ⚠	QHS3876-162	QHS3876-162BS	QHS3876-162	QHS3876-162
6	4-(2)	AC Outlet ⚠	QMC0437-002	–	–	QMC0437-002
20	11.	Siemens Plug ⚠	–	–	–	E04056
6	4-(2)	9 kHz/10 kHz Select Switch	QSS2201-002	–	–	QSS2201-002
6	4-(2)	DIN Socket	–	E03623-003	E03623-003	–
11	8-(1)	Main Amp. P.C. Board Ass'y	TXX-328A (U.S.A.) TXX-328B (Canada)	TXX-328EBS	TXX-328D	TXX-328C
14	8-(2)	FM/AM Tuner P.C. Board Ass'y	TFC-33A	TFC-33B	TFC-33B	TFC-33C
6	4-(1)	Front Panel Ass'y	EFP-R2XJ	EFP-R2XE	EFP-R2XE	EFP-R2XJ
8	5.	(Dial Scale)	E23832-001	E23832-002	E23832-002	E23832-001
7	5.	Top Cover	E23762-004	E23762-005	E23762-003 (Australia) E23762-005 (Europe)	E23762-004 (U.S. Military Market) E23762-003 (Other Countries)
7	5.	Grill	–	E23862-001	E23862-001 (Europe)	–
7	5.	Cosmetic Board (L)	ED92987-001	–	–	ED92987-001 (U.S. Military Market)
7	5.	Cosmetic Board (R)	ED92987-002	–	–	ED92987-002 (U.S. Military Market)
20	11.	Warranty Card	BT20048 (U.S.A.) BT20025C (Canada)	BT20013C	BT20029C (Australia)	BT20048 (U.S. Military Market)

⚠ : Safety parts

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